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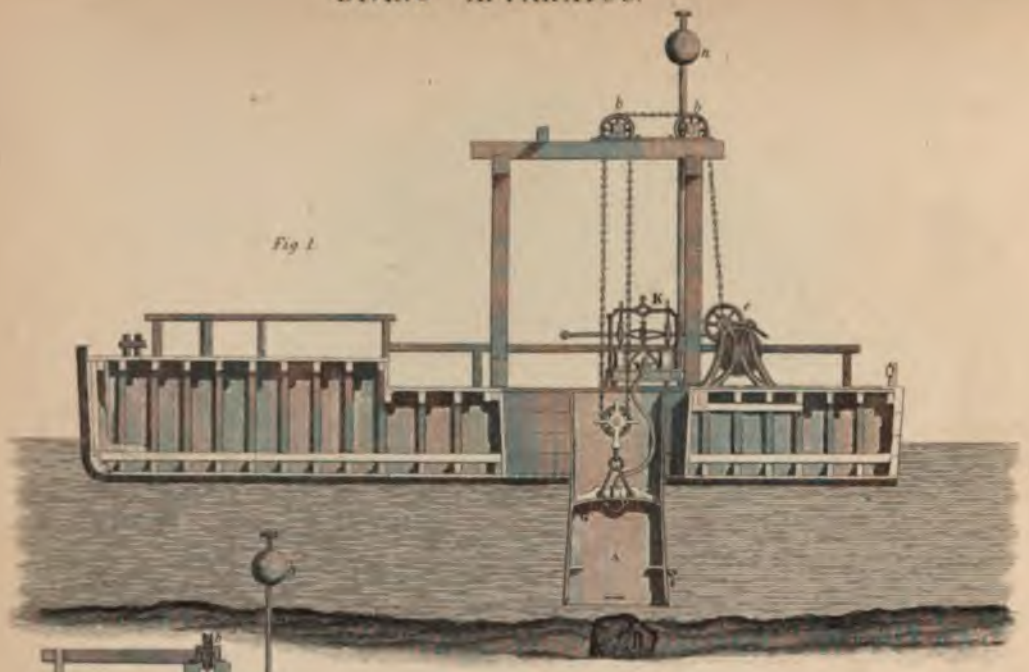

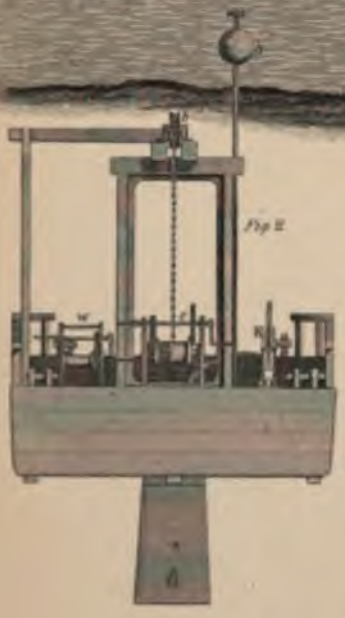

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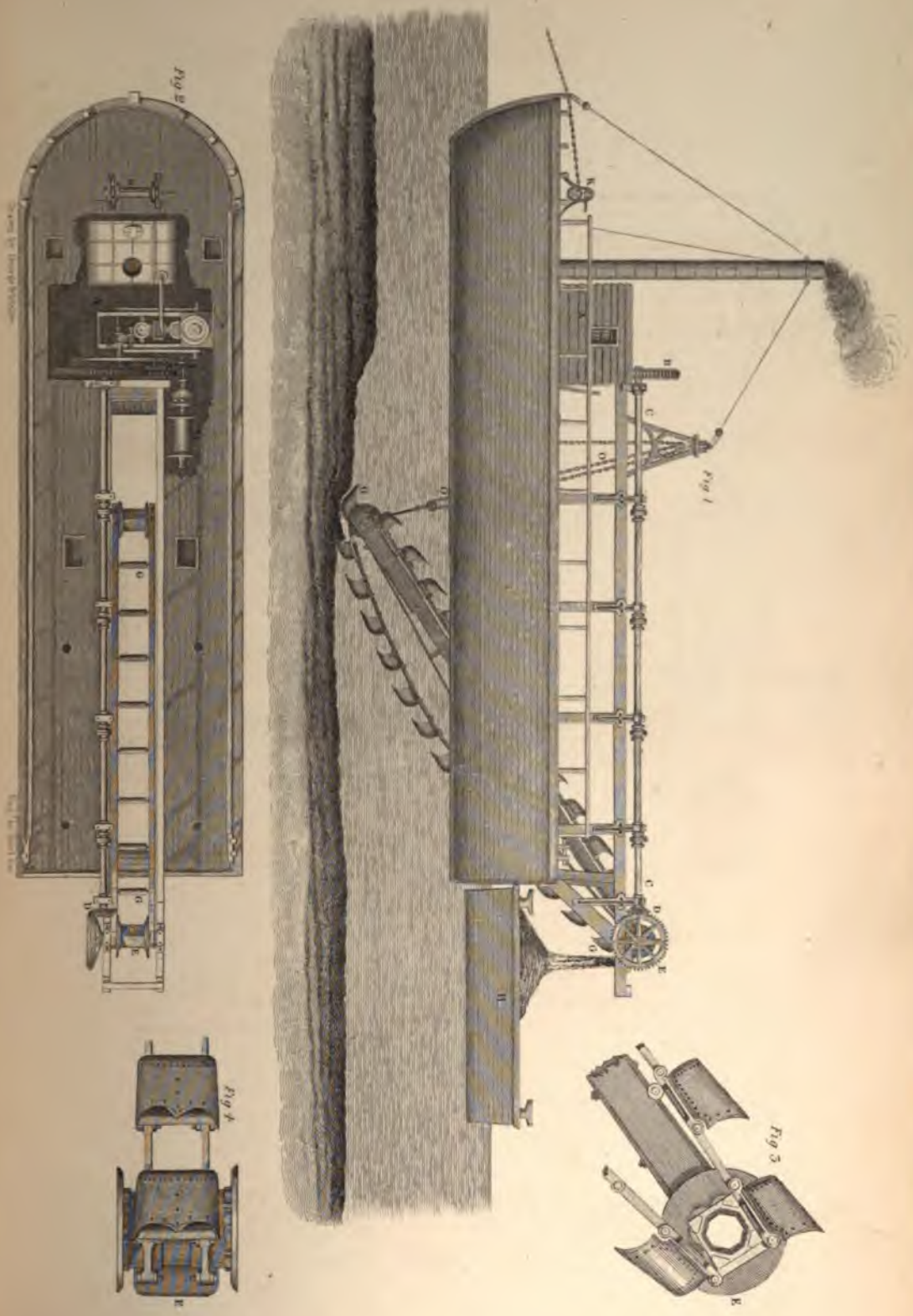

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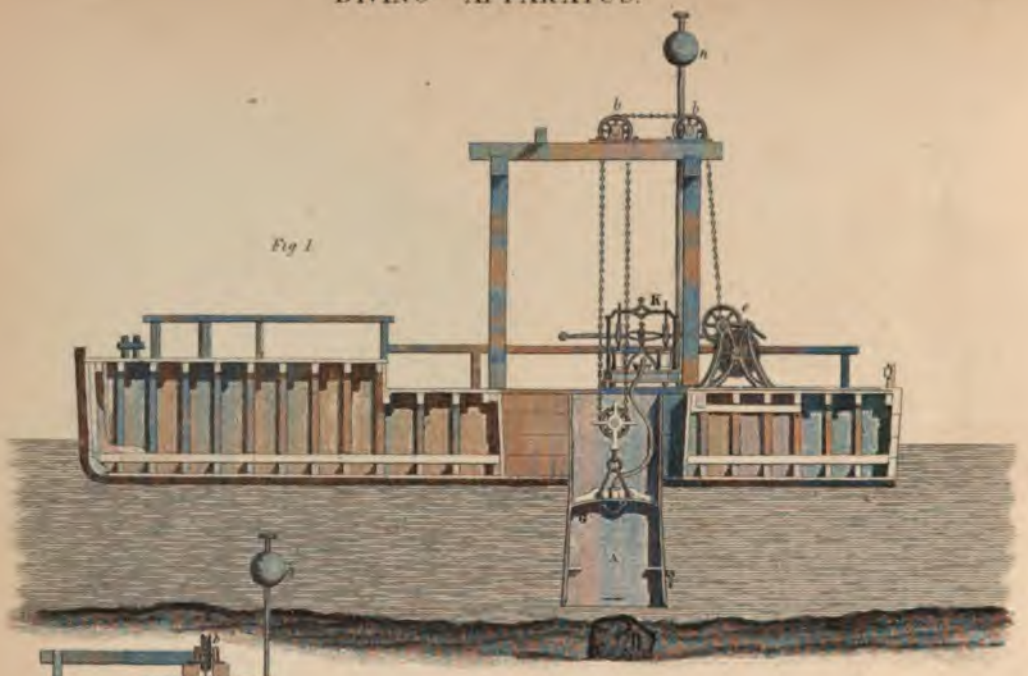

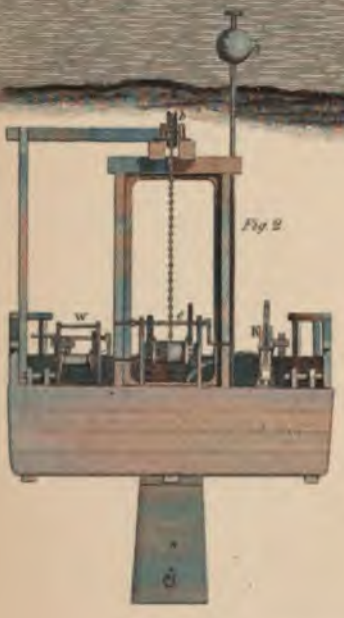

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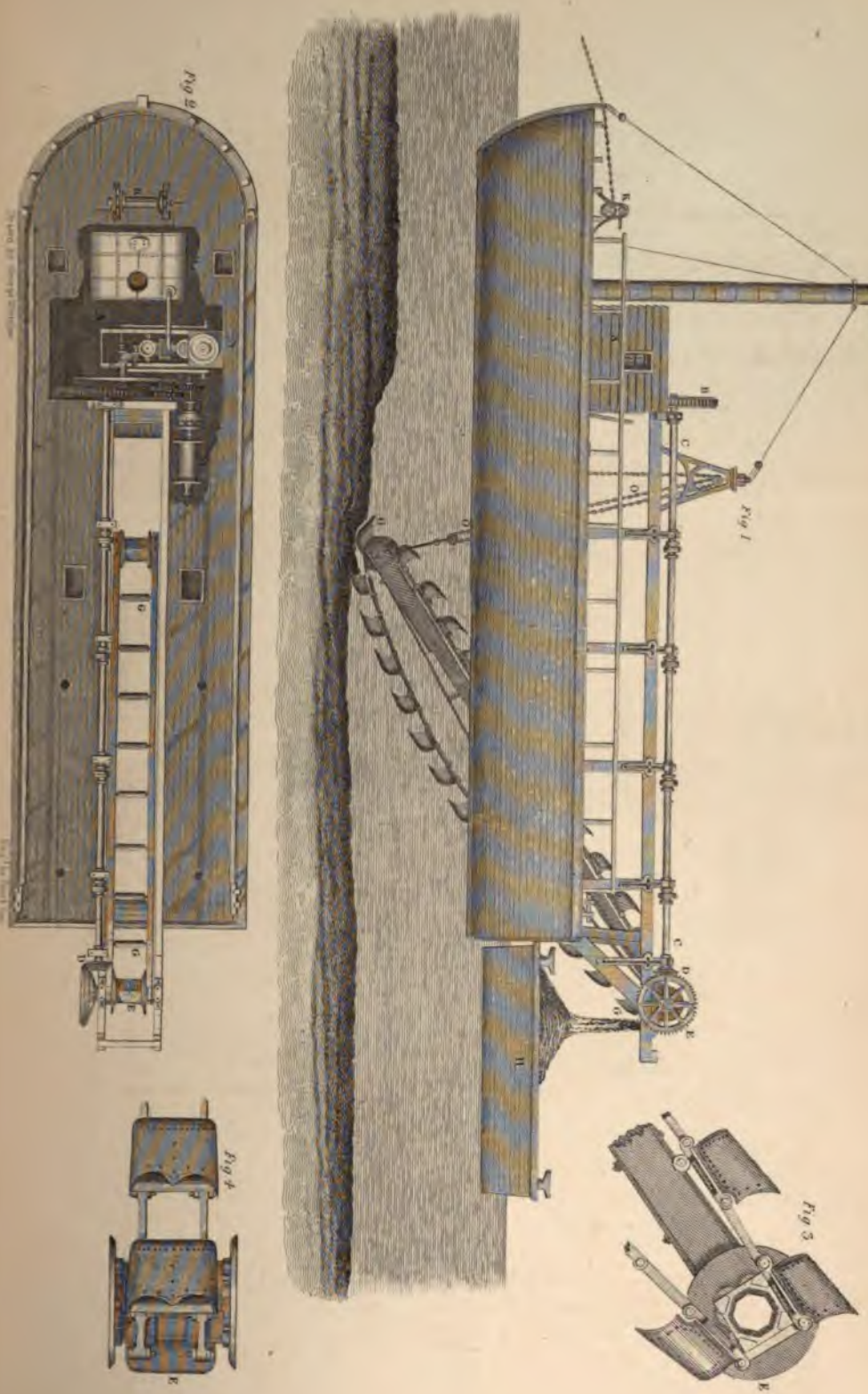

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DRAINING.

Fig. 1.

The Mole Drain Plough.

Fig. 2.

Wedge Drain.

Fig. 3.

Box Drain.

Fig. 4.

Rubble Drain.

Fig. 5.

Horse shoe Tile Drain.

Fig. 10.

Horse shoe Tile and Sole.

Fig. 6.

Pipe Drain.

Fig. 7.

Pipe with Collar.

Fig. 8.

Double Tile Main Drain.

Fig. 9.

Triple Tile Main Drain.

Fig. 11.

Spring Drain.

Fig. 12.

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

Fig. 17.

Implements rested for making various kinds of Drains.

Fig. 18.

Hand made Drain Tiles and Bricks.

Engd by Tho. Dick.

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Engd. by Thos. Dick.

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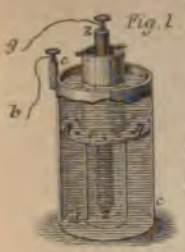
ELECTRICITY.

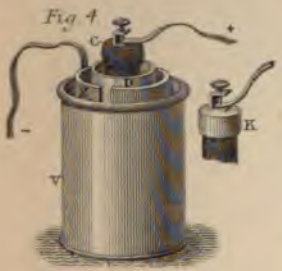
GALVANISM, ELECTRO-MAGNETISM, MAGNETO-ELECTRICITY, AND THERMO-ELECTRICITY.



Daniell's battery.

Modification of Daniell's battery in series.

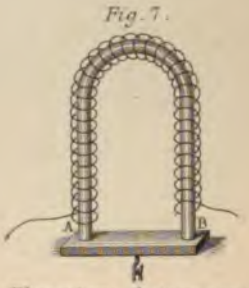
Grove's battery.



Bunsen's battery.

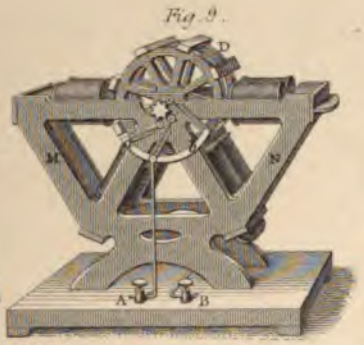
Smee's battery.

Galvanometer.



Elementary electromagnet.

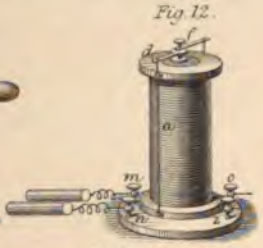
Horse-shoe electromagnet.



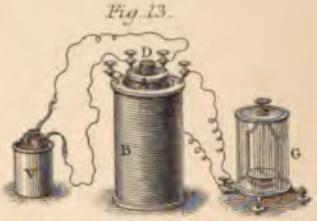
Electromagnetic engine.

Rotating magneto-electric machine.

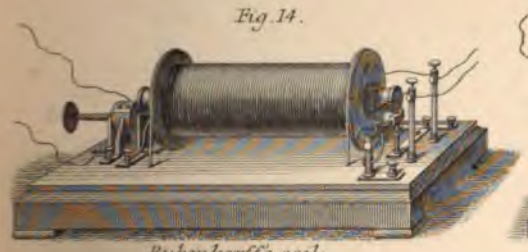
Oscillating magneto-electric machine.



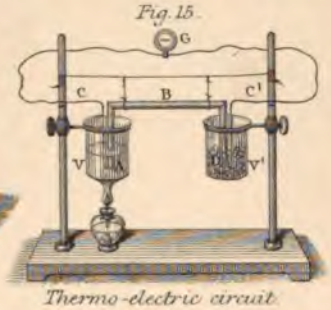
Induction-coil.



Theory of the Induction-coil.



Ruhmkorff's coil.



Thermo-electric circuit.

Thermo-pile.

J.W. Lowry sculp.t

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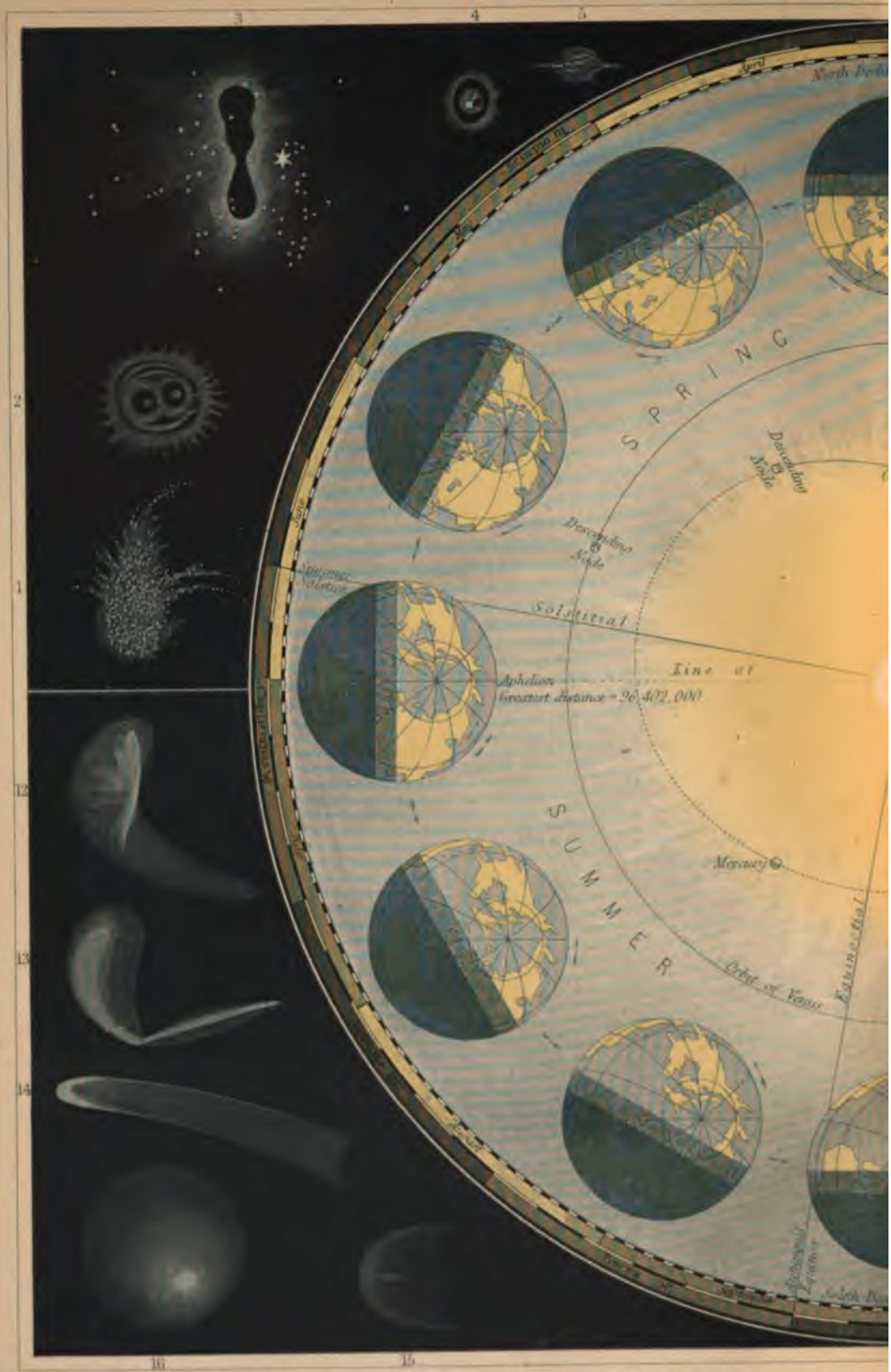
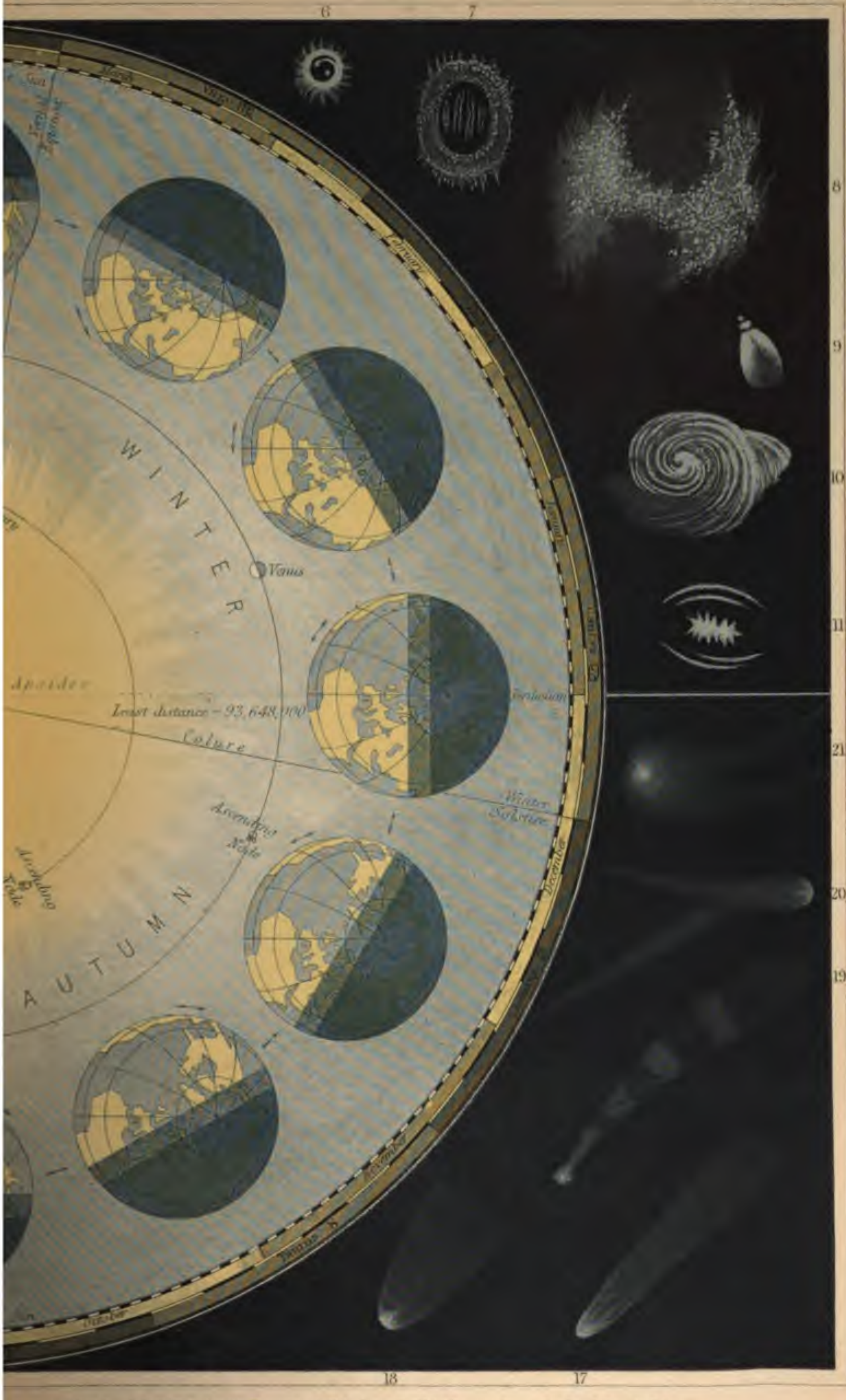
THE EARTH—ITS ANNUAL REVOLUTIO
NEBULAE



NEBULAE. 1. The Crab Nebula. 2. Round Nebula. 3. Great Nebula in Argo. 4 5 6 7. Nebulae as shown by L

COMETS. 12 13 14. Halley's Comet as seen in 1835 at different periods. 15. Halley's Comet as departing from the sun, 1836. 16. Encke's Comet as s



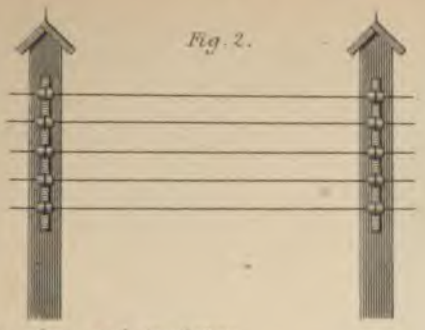
…scope 8 The dumb-bell Nebula 10 The Spiral Nebula 9 11 Nebulae as shown by Lord Ross's Telescope

…Great Comet of 1811 18 As seen departing from the sun 19 Comet of 1680 20 Comet of 1807 as seen by Bessel 21 As seen by Schroeber

ELECTRIC TELEGRAPH.

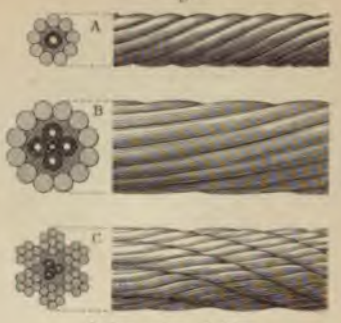
Fig. 1

Fig. 2.



Posts, wires, and insulators.

Fig. 3.



Submarine Cables.

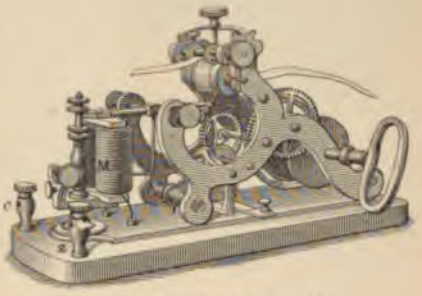
Fig. 4.

Single needle telegraph.

Fig. 5.

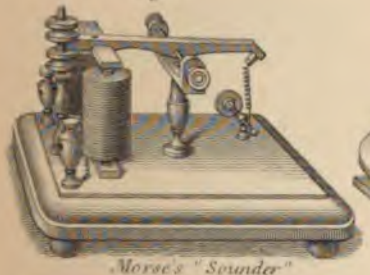
Double needle telegraph.

Fig. 6.



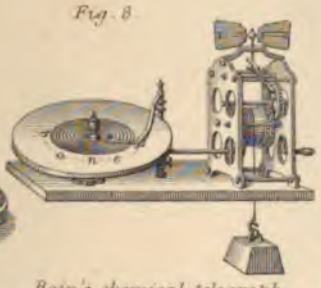
Morse's recording telegraph.

Fig. 7.



Morse's "Sounder"

Fig. 8.



Bain's chemical telegraph.

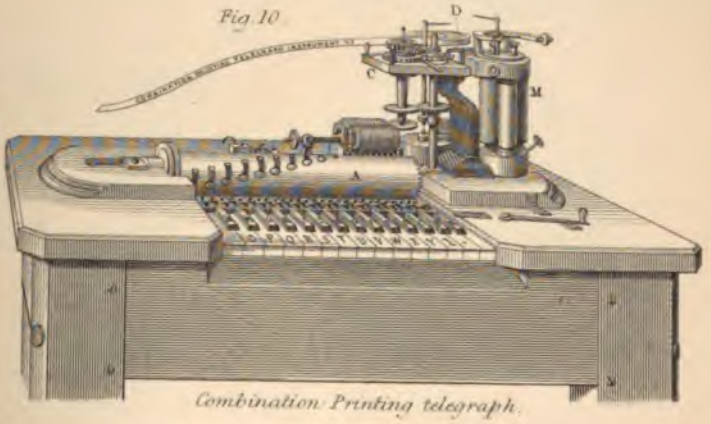
Fig. 11.

Magnetic telegraph.

Fig. 9.

Alphabetical telegraph.

Fig. 10.



Combination Printing telegraph.

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Firth of Forth
Loch Lomond
EDINBURGH
GLASGOW
Berwick
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Farne I.
Cheviot
Alnwick
Coquet I.
Blyth
N. Shields
S. Shields
Sunderland
Seaham
Hartlepool
Tees Bay
Saltburn
Whitby
Scarborough
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Bridlington Bay
Spurn Hd
Grimsby
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Skegness
Wash
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a party of English colonists who landed at Port Royal and afterwards removed to Charleston. The colony was called Carolina. Its constitution was framed by John Locke. Georgia, originally a part of Carolina, was granted by George II., after whom it was named, to a new colony from England in 1732.

Colonies were early established in the West India Islands, including Barbadoes, half of St. Christopher's (1625), and soon after many smaller islands. Yet the West India possessions did not become important as plantations until the sugar-cane was introduced into Barbadoes (1641) and into Jamaica in 1660. This island had been taken from the Spaniards in 1655. The cultivation of coffee was introduced in the West India Islands in 1732. Newfoundland (in French, *Terre-neuve*) was taken possession of by the English in 1583, colonized in 1621 and 1633. Canada was surrendered to Britain at the Peace of Paris in 1763. In 1764 began the dispute between Britain and its North American colonies, on the question whether the former had the right to impose taxes on the colonies when they were not represented in the British Parliament; and, April 19, 1775, commenced the war, which terminated with the acknowledgment of the independence of the thirteen provinces.

Australia was discovered in the beginning of the seventeenth century. The great distance of this new continent probably prevented any early European settlements from being made in it, and this also afforded an inducement to the English to try here a seemingly plausible experiment, which better knowledge and experience has caused to be abandoned. The first Australasian settlements of Great Britain were penal colonies. New South Wales, discovered in 1770, was established as a penal colony in 1788; Tasmania (Van Diemen's Land), discovered by Tasman in 1642, followed in 1803; West Australia, also first used as a penal settlement, became a free colony in 1829; Victoria (Port Philip) was colonized in 1835, and made an independent colony under its present name in 1851; South Australia was settled in 1836; New Zealand, discovered by Tasman in 1642, began to be used for whale-fishery about 1790, was settled in 1839, and made a colony in 1840. Queensland became a separate colony in 1859. In 1851 gold was discovered to be plentiful in Victoria. It had previously (1844) been found to exist in South Australia. This gave a great impetus to the prosperity of the Australian colonies, and the influx of population it caused has contributed to promote their general development. A still more important product as regards the permanent prosperity of the colonies is wool, for the extensive cultivation of which the large pastures of Australia afford ample facility, and which has become their most important export.

In Europe Great Britain has a few colonies acquired for military reasons: Gibraltar in 1704; Malta and Gozzo, 1800; Heligoland, 1807.

France was somewhat late of entering fully upon the colonial career, being retarded by internal dissensions and religious wars. A scheme of colonization was projected in the midst of these by Coligni, but Richelieu and Colbert were the first French statesmen to turn the enterprise of the nation practically in this direction. Between 1627 and 1636 Pierre Belain d'Esnambuc colonized St. Christopher's, Guadeloupe, and Martinique. Champlain was the pioneer of the French in the exploration of the North American continent, where they soon had considerable possessions, including Canada—in which they had settlements as early as 1604–5, and where Champlain founded Quebec in 1608—and Louisiana, colonized in 1699. Commercial companies, then deemed essential in colonizing, were established by Colbert in 1664. He purchased on several West India Islands, as Martinique, Guadeloupe, St. Lucia, Grenada, and others, settlements already formed by private persons, and sent out colonists in 1664 to Cayenne. But the settlements in part of St. Domingo, by the piratical state of the buccaneers, became of more importance than those effected by the government. The West India Company survived only ten years. In 1664 Colbert also founded an East India Company, which, after fruitless attempts to form a colony in Madagascar, founded Pondicherry on the Coromandel coast in 1670, which became the capital of extensive possessions in the East Indies. Among the last acquired of these were the Île de France (Mauritius), and Bourbon (Réunion), occupied in 1720. At the beginning of the eighteenth century France had acquired an important position as a colonial power. In North America her settlements extended from Canada to California, particularly along the great lakes and the Mississippi river, embracing many districts which have since become of the highest importance; Nova Scotia (Acadie) and Newfoundland (Terre Neuve), which had been disputed with Great Britain, were then in her possession. Her West India Islands were more flourishing than those of England, and she still had a prosperous career before her in India. The French attribute the decline of their colonies to bad administration, particularly the centralization of authority in the hands of the home government, and the want of support from that government during war.

The superiority of the fleet of England gave that power a great advantage in colonial contests, and many of the French colonies consequently fell under the power of Great Britain. The struggle for the supremacy in India, though finally unsuccessful, was long and gallantly maintained, and more than once seemed to promise a different issue. The North American colonies were partly lost by conquest and partly suffered to fall into decay. Of the West India possessions several were taken by Great Britain, and finally ceded to her. Canada was finally ceded to England in 1763, Louisiana, after being surrendered to Spain, to prevent it from falling into the hands of the English, was sold by Napoleon to the United States in 1803.

At the general pacification of 1815 France recovered some remains of her colonial possessions. Since then she has occupied in 1830 and begun in 1833 to colonize Algiers, a country whose irregular and lawless government had exposed her as well as other European states to frequent inconvenience. The chief colonial possessions of France at present are in India, Pondicherry, Carrical, and a few other small territories; Cochin China in Asia; New Caledonia, the Loyalty and Marquesas Islands in Oceanica; in Africa, Algeria, Senegambia, island of Réunion, &c.; in America, Martinique, Guadeloupe, and Guyana, besides some protected countries in Asia and Oceanica. The French colonies are represented in the National Assembly. Algiers is divided into the three provinces of Alger, Oran, and Constantine, each of which returns two members; Martinique returns two, Guadeloupe two, Réunion two, Guyana one, Senegal one, the French East Indies one.

Denmark established an East India Company in 1618 with a view to enter on the colonial trade. This company was dissolved in 1634; a new one was formed in 1670; a third in 1686; a fourth in 1731–2. The rights of the existing company were purchased by the king in 1777, and a new charter granted in 1792. In the same year, with the formation of the first company, the colony of Tranquebar was founded on the Coromandel coast. Its success was fluctuating, like that of the companies formed to manage it,

and in 1845 it was sold to the East India Company. St. Thomas in the West Indies was settled by the Danes in 1672; St. John, Santa Cruz, and some of the smaller islands in the same group, the Virgin Islands, were also occupied by them. The island of Santa Cruz was purchased from France in 1733 for 738,000 francs. These islands constitute the present colonial possessions of Denmark. The Danes and also the Austrians made attempts to settle in the Nicobar Islands, but unsuccessfully. Sweden established an East India Company in 1741. She acquired the island of St. Bartholomew from France in 1785. It is her only colony.

A company was first established in Russia in 1787 for obtaining furs on the Kurile Isles, the Aleutian Isles, and the N.W. coast of North America. An ukase in favour of this company, forbidding other nations to trade and fish on the coasts of Asia and North America, from 51° N. lat. on the American side, and the south cape of the island of Urup on the Asiatic, together with the intermediate islands, met with opposition from the United States; but by a treaty concluded at St. Petersburg, April 17, 1824, it was agreed that the people of both governments should be allowed to trade or fish unmolested in any part of the Pacific Ocean or its coasts. It was also agreed that no establishment should be formed on the N.W. coast to the N. of 54° by citizens of the United States, nor to the S. of the same point by Russian subjects. Colonization in Russia may be considered as only a direct extension of her immense territory, and in this respect forms an integral part of Russian history, an outline of which will be found under its proper head.

Colonial Policy.—The policy pursued by the different nations of Europe in the extensive career of colonizing which we have reviewed differed in details, but was so much alike in general principles that it may be conveniently discussed here as a whole. The colonizing movement which began at the end of the fifteenth century was as much a distinct movement springing from a common impulse as that of the crusades begun at the end of the eleventh. The nearly simultaneous discovery of America and of the route by the Cape of Good Hope to India was the beginning of a new era for the commerce of Europe, and neither the condition of the natives of America nor of India left any other way open of giving to the nations of Europe the advantage of free intercourse with countries possessing such vast and undeveloped resources, but that of forming settlements in them either for trade or occupation. The formation of such settlements necessarily involved great sacrifices both on the part of those who made them and of those who supplied the resources for them to do so. Hence it was natural that in despotic countries, such as Spain and Portugal, the first settlers should be directly dependent on the crown, and the government of the new colonies should be entirely dependent on the home administration, and that in free countries, like Holland and England, private enterprise, inadequate without organization to such great undertakings, should be wholly dependent upon great companies chartered by government, and secured by special privileges against a competition which might have deprived them of the fruits of their outlay as soon as the difficulties of colonizing had been removed. This was the most marked distinction in the colonial policy of the different states, which was otherwise alike in its most essential features. The spirit of monopoly was everywhere, and the jealousy of interference nearly alike in all. Even the navigation of seas was interdicted to guard against any encroachment on the privileges of the cherished and often feeble possessions. Jealousy and weakness produced hatred, and wherever the rival colonists met by sea or land, the most violent antipathies were liable to break out, and the most pitiless and exterminating contests were waged. The early discoveries of gold gave a special character to Spanish colonization. It diverted the colonists from the ordinary channels of trade, and together with the motives supplied by fanaticism proved a powerful incentive to conquest, for which, by the numbers it drew to the colonies, it also supplied the means. The Portuguese, by endeavouring to confine the whole trade of Europe with the East Indies to the port of Lisbon, prepared the way for the violent overthrow of their own colonies. The Dutch, excluded from the port of Lisbon by the enmity of Philip II., advanced upon the Indies, and conquered for themselves from his Portuguese subjects the means of opening up a direct trade with Europe.

The Dutch and the English were less impracticable, but hardly less exclusive than the Spanish and Portuguese. They did not confine trade to particular ports and fleets, but they limited it as strictly to privileged companies. Even the colonists themselves, though native subjects of the state, were absolutely bound by the privileges of the companies, and by the restrictions devised for the benefit of the home country and the exclusion of foreign participation in the advantages of the colonial trade. The American colonists of England, otherwise the least subject of any colonists to restraint, could exchange the produce of their own labour only for the products of the mother country, or such foreign products as she chose to send them at her own price, could receive supplies only in her vessels, and could not manufacture without her permission. So anomalous, on the other hand, were the privileges of the great companies, that they were permitted, without the least interference from their own government, to undertake the conquest of vast foreign states, and rule over them with despotic authority; and so entirely was the policy of these companies dictated by their own interest, that the Dutch East India Company frequently destroyed the produce of their colonies when it exceeded an amount that could be disposed of at their monopoly prices.

In extreme contrast with all this is the mercantile and colonial policy pursued at the present day, particularly in Great Britain. The British colonies in America had from the first considerable political liberty, and greater commercial freedom followed from this as a matter of course. The right of taxing them without their own consent, which led to the revolt of the thirteen provinces, would in all probability have been ultimately given up to a less determined opposition. The colonists were never without their advocates in the mother country, and while it may well be doubted whether these colonies could without asserting their independence have grown to the present magnitude and importance of the United States, it seems almost certain from the event that they might have obtained all, and much more than all, they originally contended for. The East India trade, from its peculiar nature, continued longer than the American to be a strict monopoly, but in 1833 the trading privileges of the East India Company finally came to an end, and for the future it was concerned only with the government of the country. Finally, since the adoption of a free-trade policy in this country, the whole trade of our colonies has been thrown open without reserve, as far as the privileges of the mother country are concerned, to the competition of foreign nations. Other countries, while not following our commercial policy entirely, have relaxed more or less the stringency of the regulations affecting their colonial trade.

COLOPHON (Greek, a summit). The imprint at the end of a published work, which in old books frequently stated the name of the author as well as the printer's name, date, and place of publication, most of which information is now usually put in the title-page, was called a colophon. According to some authorities the use of the term in this sense is derived from the Greek proverb, 'to put the colophon' to a thing, a phrase which is said again to have originated in the boast of the city of Colophon that the charge of their cavalry usually put the termination to a battle.

COLORADO, several rivers, America:—1, COLORADO DEL OCCIDENTE, has its sources apparently among the Rocky Mountains, about lat. 43° N., and 150 miles N.E. of the Great Salt Lake, flows S.E., and S., under the name of the Green River, passing through the territories of Wyoming, Colorado, Utah, and Arizona, and then S.W. through Upper California, receiving several important affluents, and after a course of about 1200 miles falls into the head of the Gulf of California. The Colorado proper is formed by the junction of the Green and Grand Rivers, about lat. 35° 30′ N., lon. 112° 55′ W.—2, COLORADO DE TEXAS, rises in the N.W. part of the state, flows generally S.E., and after a course of about 900 miles falls into Matagordo Bay at the town of Matagordo.

COLORADO, a territory, United States, so called from the river of the same name, and recently formed out of the territories of Utah, Nebraska, and Kansas. It lies between lat. 37° and 41° N., and lon. 102° and 109° W., and contains an area of about 100,000 square miles. It is divided into two parts by the Rocky Mountains, from which the western division receives a multitude of tributaries, flowing to join the Colorado, and the eastern a number of streams belonging to the basins of the Arkansas and the Platte. The region of the Pike Peak, so rich in gold and other minerals, is included within the Colorado territory. Pop. in 1870, 39,681.

COLOSSÆ, or COLOSSAI, a city of Phrygia, first mentioned by Herodotus, situated on the Lycus, a branch of the Mæander. Little is known of Colossæ, which had disappeared by the middle ages, and it is uncertain whether it was superseded by the town of Chonæ in its neighbourhood, or whether Chonæ was Colossæ with only a change of name. Xerxes passed through Colossæ on his march to Sardis, B.C. 481, and the younger Cyrus in proceeding from Sardis to the Euphrates, B.C. 401. The epigraph on the coins of Colossæ (*dēmos Kolossēnōn*) shows it to have been a city. It was a place of considerable mercantile importance in the time of Strabo.

The apostle Paul addressed one of his epistles to Colossæ, from which it appears that it was the site of one of the early Christian churches, but it does not appear from the epistle that the apostle ever visited it.

COLOSSEUM. See COLISEUM.

COLOSSUS (Lat.; *Kolossos*, Gr.), in sculpture, a statue of enormous magnitude, from which our adjective *colossal* is derived. The practice of executing statues of colossal dimensions and proportions is of very high antiquity. The people of the East, from the most ancient times, have been celebrated for colossal sculpture. The pagodas of China and of India, and the excavated caverns of the East, abound with colossi of every denomination. The Asiatics, the Egyptians, and, in particular, the Greeks, have excelled in these works. The celebrated colossus of Rhodes was reckoned one of the seven wonders of the world. This statue, which Muratori reckons among the fables of antiquity, was raised by the Rhodians in honour of Apollo. There are many contradictory accounts in ancient authors concerning this colossal statue of Apollo; but the following, gathered from several sources, is not devoid of interest, though mixed up with much fable. When Demetrius, king of Macedon, the son of Antigonus, laid siege to the city of Rhodes, because the Rhodians would not renounce their alliance with Ptolemy Soter, they were succoured by their allies, and particularly by Ptolemy, so effectually, that the besiegers were compelled to abandon their enterprise. The Rhodians, in recognition of their regard for these services of their allies, and of the protection of their tutelary deity Apollo, resolved to erect a brazen statue of the sun of a prodigious size. Chares, the disciple of Lysippus, was intrusted with the project. He had scarcely half-finished the work, when he found that he had expended all the money he had received for the whole, which overwhelmed him so completely with grief and despair that he hanged himself. Laches, his fellow-countryman, finished the work in the space of three olympiads (twelve years), and placed the enormous statue on its pedestal. Pliny does not mention the latter artist, but gives all the honour to Chares. Scarcely sixty years had elapsed before this monster of art was thrown from its place by an earthquake, which broke it off at the knees; and so it remained till the conquest of Rhodes by the Saracens in A.D. 684, when it was beaten to pieces, and sold to a Jew merchant, who loaded above 900 camels with its spoils. Strabo, Pliny, and other ancient authors, who lived at the time that the colossus of Rhodes is said to have been in existence, and who could have learned from contemporaries the truth or falsehood of the accounts of it, give its height at 70 cubits, or about 100 English feet. Other authors, who flourished since its destruction, report its height at 80 cubits. Pliny relates several particulars, as that few persons could embrace its thumb, and that its fingers were as long as ordinary statues, which, calculated by the proportion of a well made man, would make its height nearer to 80 than 70 cubits. Some modern authorities, however, place the height lower than either of these estimates, making it about 90 feet. The statue was placed across the entrance of the harbour, with its feet on two rocks; and the Rhodian vessels could pass under its legs. Some antiquaries have thought with great justice, that the fine head of the Sun, which is stamped upon the Rhodian medals, is a representation of that of the colossus. Of other colossal statues, those which were executed by Phidias are among the most celebrated for beauty and elegance of workmanship. They were his Olympian Zeus and his Athena of the Parthenon. The virgin goddess was represented in a noble attitude, 26 cubits or 39 feet in height, erect, clothed in a tunic reaching to the feet. In her hand she brandished a spear, and at her feet lay her buckler and a dragon of admirable execution, supposed to represent Erichthonius. On the middle of her helmet a sphynx was carved, and on each of its sides a griffin. On the ægis were displayed a Medusa's head and a figure of Victory. This colossal work was not only grand and striking in itself, but contained, on its various parts, curious specimens of minute sculpture in bass-relief, which Phidias is said to have brought to perfection. His Olympian Zeus was executed after the ungrateful treatment he received from the Athenians, when he abandoned the city of his birth, which he had rendered celebrated by his works, and took refuge in Elis. Animated rather than subdued by the ingratitude of his countrymen, Phidias laboured to surpass the greatest works with which he had adorned Athens. With this view he framed the statue of Zeus Olympius for the Eleans, and succeeded even in excelling his own Athena in the Parthenon. This colossal statue was 60 feet in height, and completely embodied the sublime picture which Homer has given

of the mythological monarch of the heavens. While describing the colossi of ancient times, we should not forget the magnificent and extravagant proposal of Dinocrates to Alexander the Great, of forming Mount Athos into a colossus of that conqueror; nor a similar proposal in modern times, of sculpturing one of the Alps, near the pass of the Simplon, into a resemblance of Napoleon. Among other celebrated colossi of ancient times, historians record as eminently beautiful that which was executed by Lysippus at Tarentum. It was 40 cubits or 60 feet in height. The difficulty of carrying it away prevented Fabius from removing it to Rome, with the statue of Hercules, belonging to the same city.

Colossi were in use also in Italy before the time when the Romans despoiled their vanquished enemies of their works of art. The Jupiter of Leontium in Sicily was 7 cubits in height, and the Apollo of wood that was transported from Etruria, and placed in the palace of Augustus at Rome, 50 feet. The same emperor also placed a fine bronze colossus of Apollo in the temple of that god, which he built near his own palace. The earliest colossus recorded to have been sculptured in Rome was the statue of Jupiter Capitolinus, which Spurius Carvilius placed in the capitol after his victory over the Samnites; but colossi soon became far from scarce. Five are particularly noticed; namely, two of Apollo, two of Jupiter, and one of the Sun. There has been dug up among the ruins of ancient Rome a colossal statue of the city of Rome, which was reckoned among the tutelary divinities of the empire. The superb colossi on the Monte Cavallo, believed to represent Castor and Pollux (the Dioscuri), are magnificent specimens of Grecian art; so are the Farnese Hercules and the gigantic Flora of the Belvedere.

Among modern works of this nature is the enormous colossus of San Carlo Borromeo, at Arona, in the Milanese territory. It is of bronze, 60 feet in height, and has a staircase in its interior for the purpose of occasional repairs and restorations. The bronze colossus, copied from one of the Monte Cavallo statues, in Hyde Park, London, and a few but little larger than life, of the size that may be termed *heroic* rather than *colossal*, such as decorate some public buildings and commemorative columns, are nearly all that Britain can boast of in this noble style of art. The four colossal statues at Paris, which are in front of the façade of the palace of the chamber of deputies, are in good taste, and show great boldness and freedom in the execution. They represent the four greatest legislators of France—Sully, Colbert, L'Hopital, and D'Aguesseau. They are in their proper costume and seated. Canova's Perseus is also much larger than life and a very fine work. It belongs rather to the heroic than the colossal.

COLOUR is the name given to distinguish between the various sensations that lights of various rates of vibration give to the eye. The optic nerves are excited by vibrations of the light-bearing ether when the rapidity of the vibrations is not greater than or less than two limits, which perhaps vary slightly with different eyes, just as some ears cannot hear intensely shrill sounds or dull sounds that are perceived by others. Every vibration between these limits is recognized as light; its intensity or brightness is observed; but besides this the eye is differently affected by light of different times of vibration, in a way that it is not possible to describe. It is to this variation in the sensation that the name *colour* is given. As is the case with many of the words that denote our sensations, the word *colour* is also applied to the properties of bodies that cause them to emit the light that thus affects our senses.

In considering the subject we must remark in the first place that ordinary white light, the light which comes from an incandescent solid or liquid, consists, as Newton showed by his celebrated experiment of passing it through a triangular glass prism, of a large number of coloured lights, which, meeting the eye together, produce the sensation of white light. (Our articles on SPECTRUM and LIGHT must be consulted for full information on this subject.) The colours of the spectrum are usually said to be seven—red, orange, yellow, green, blue, indigo, violet: although in reality there is an enormous, if not an infinite number of perfectly distinct colours in it. These colours are frequently called the primary colours, and other tints and shades are producible by mixing them. They may be recombined so as to make white light, as the following experiment shows. Let a disc be painted as nearly as possible with the primary colours of the spectrum in sectors of the magnitude indi-

cated in the diagram. If this painted circle be made to whirl rapidly round its centre, all the colours will practically be seen simultaneously at each point, owing to the persistence of the impression on the retina of the eye (see PERSISTENCE OF VISION), and the effect will be that the circle will appear white. If the proportions of the coloured sectors be altered, or if any of them be cut out of the circle or covered with white or black paper, various colours or shades of colour are producible. If one complete sector be removed, and the wheel whirled round, the colour produced is called the *complementary* colour to the removed sector: it is the resultant of all the other colours, which, taken with that sector, would go to make up white. For example, if the red sector be cut out, and the rest of the circle whirled round, a green circle will be seen. Green is therefore called the complementary colour of red. There has been much metaphysical writing about the harmony of complementary colours, which was chiefly founded on a forced analogy between colour and musical sounds. The theory has but little support from experiment and observation of nature.

When white light falls on the various objects that surround us it is not always reflected back to our eye as white light. The bodies are illuminated by it, but they have the power of so altering it that they appear to us coloured. The reason of the natural colours of bodies is a difficult subject, and one that is scarcely yet understood. It is usual to say that the surfaces of bodies have the power of absorbing certain parts of the white light, and reflecting the remainder back, and that what we see is the complementary colour to that which is absorbed. This is generally the case with light passing through a transparent coloured body. But there is good reason for thinking that this is not really the case always. Experiment, in fact, seems to show that the light

which comes from coloured bodies is frequently generated by the bodies themselves by a kind of *luminous resonance*, as it has been called; just as a harp with two or three strings will send out a sound by resonance when a loud noise of any kind is made near to it, but the sound emitted by the harp will be only that belonging to its two or three strings, and not a clash like that which set it in vibration. The subject is one of much difficulty, as we know nothing of the molecular construction of the surfaces of bodies.

Lastly, we have to speak of the coloured lights produced by ignited gases. The lights themselves are often far less complicated than white light, though we have spoken of them last. Incandescent gases, instead of giving out white light, as incandescent solids and liquids do, give out light of colours depending on the nature of the gas or vapour. Seen by the eye the flame is coloured, and examined by the spectroscope it is found to be in many cases a very simple light indeed. Thus sodium vapour gives a yellow light, and on looking at a flame containing nothing but sodium, it is seen to consist of two particular yellow lights shown by two bright yellow lines in its spectrum. Thallium, another metal, gives a simple green light. Hydrogen gas also gives a pale blue flame when burning, and shows some five or six bright lines. So also do other gases. See also SPECTRUM.) These coloured flames are taken advantage of by the pyrotechnist, who mixes the powder for his fireworks with various bodies which give coloured flames.

COLOUR-BLINDNESS, a singular affection, producing an inability to distinguish one colour from another, and in certain rare cases to discern colour at all, the eye perceiving only light and shade, or black and white. Almost no attention appears to have been paid to this subject till the end of the last century, when the celebrated chemist Dr. Dalton brought it into notice by publishing in 1794 an account of his own case as marked by this peculiarity. More recently Dr. George Wilson of Edinburgh also examined minutely into this phenomenon, and collected many striking instances. From the result of these investigations it would appear that colour-blindness is much more common among men than women, and that of the former one in twenty is unable to discern the nicer shades of colour, and one in fifty to distinguish certain primary colours from one another. The colours most liable to be confounded are red and brown with green, purple and green with blue, red with black, light hues of all sorts with white, and dark shades with black. Many of the instances adduced by Dr. Wilson are exceedingly curious and amusing. An undertaker covered a coffin with bright scarlet instead of black; a chemical lecturer had to ask always the colours of his compounds; a physician never met with scarlet-fever in the course of his practice; a gentleman meeting a lady in a green dress condoled with her on the bereavement which he imagined she had sustained; and a Quaker purchased a bottle-green coat for himself and a scarlet merino gown for his wife. The cause of this remarkable affection is unknown, but it is probably attributable to some peculiarity of structure in the retina or brain. The eyes of persons so constituted present in general nothing abnormal either internally or externally, while their power of vision is equal to, and in many cases even superior to that of persons in whom no such peculiarity exists. The colour most easily distinguished by the colour-blind is yellow, which is rarely mistaken for other colours, and the use of yellow spectacles has accordingly proved advantageous in some cases. It is a curious fact that the substitution of artificial for day light often enables persons affected in this manner to discern colours.

COLOURING, one of the essential parts of painting—namely, that part which relates to colours. Besides a knowledge of the art of preparing and mixing colours, and the whole mechanical process, from the beginning to the finishing of a picture, which in the various kinds of painting varies according to the materials of each, colouring comprehends the knowledge of the laws of light and colours, and all the rules deducible from the observation of their effects in nature, for the use of the artist. This subject has been treated by Leonardo da Vinci in his work on painting; Lomazzo and Gérard Lairesse in books on the same subject; Mengs in his Praktischer Unterricht; Goethe in his Farbenlehre; &c. The skill of the painter presupposes a natural ability founded on superior sensibility—namely, the ability to image forth, and in the imitation to express with characteristic truth the peculiar substance and colour of any object under the influences of the light and air. To make this imitation successful an accurate attention to the local tones and tints is requisite. By *local tones* we understand the natural colour of an object as it appears on the spot where it stands, or from the spot where the spectator is supposed to be stationed. In works of art the natural colour of an object appears always as a local tone, because every object must be regarded from only one point of view, conformably to which the natural colour is modified according to the supposed distance. By *tints* we understand, in a more restricted sense, the gradations of the clear and obscure which lights and shadows produce on the coloured surface. (See CHIAROSCURO.) In no object of art do these modifications and shades exist in greater delicacy and diversity than in the naked human body, which is consequently the most difficult subject for a painter. Colouring, in as far as it is an imitation of the colour and character of flesh (the naked body), is called *carnation* (which see). If, in addition to the accurate coincidence of the natural colours, local tones and tints of a painting, with its original, the artist hits the expression of the peculiar character of the substance of which the object consists, the colouring is called *true*. But to truth should be joined beauty, which is attained by the harmonious union of all the tones of the painting into one leading tone. The colouring must conform to and promote the object of the painting as a work of art, and by the harmony of the colours and lights, as well as by the truth of the local colours and of the individual parts of the subject, constitute one beautiful whole. In the choice of lights and the distribution of colours the artist should aim not only at clearness of representation, but at the same time at the production of a pleasing harmony, which should aid the general impression of the piece. Consequently *keeping* and *chiaroscuro* are comprehended in the idea of correct, beautiful colouring. We often see pictures in which the colours are true to nature, but which have little merit as works of art, because they are deficient in that harmonious union of excellences which is essential to a beautiful painting.

COLOURING MATTERS. This name ought to include every substance, organic or inorganic, which is the cause of colour in another, but in practice it is restricted to the natural colouring matters of vegetables and animals. The reason of this restriction probably is that these colouring matters are distinctly different from the tissues or fluids which contain them, whereas the colour of a mineral is not in general due to an isolable body, but is peculiar to the mineral itself. It is impossible, for instance, to take away the blue colour of a copper compound, or the

green or yellow of one of chromium. In the mineral world the analogy to the colouring of plants is found rather in rocks; for example, in a sandstone coloured with oxide of iron, where the colouring matter may be removed without the rock mass being destroyed.

The organic colouring matters derived from vegetables are both important from their uses in the arts and interesting from their character and decompositions. They may be divided into two classes, those which exist ready formed in the plant, and those which are obtained by the spontaneous or artificial decomposition of some principle in the plant. Of those belonging to the first class, *chlorophyll*, the green colouring matter of the leaves, and the different colours in the flowers are the most obvious. Those, however, which are used in the arts are not at first sight apparent, being contained in the seed, bark, stem, or roots, from which they can be extracted by water, alcohol, ether, dilute alkalies, &c. The second class includes bodies which result by oxidation or other chemical change from some usually colourless matters, to which the name *chromogens*, colour-producers, has been given; the question having been raised whether all colouring matters, even in plants, have not been produced from prior chromogens. The colouring matters have been subjected to investigation by numerous chemists, but notwithstanding very little is known about their real constitution. It is certain that many of the crude colours of commerce are mixtures, and it is highly probable that when better known their constituent principles will turn out to be diverse in constitution. Colouring matters are generally odourless, with a rough taste, soluble, some in water, others in alcohol. Indigo and alizarine can be sublimed, but most are decomposed by a slight elevation of temperature. They all consist of carbon, hydrogen, and oxygen, to which in some cases nitrogen is added. Some exhibit a weak acid tendency, combining with the oxides of lead, copper, and especially tin, iron, and aluminium, and forming insoluble coloured compounds called *lakes*. Some have the power of attaching themselves permanently to different vegetable and animal fibres, as silk, wool, cotton, and linen; others are unable to give a colour which will not redissolve in water: in such cases the fibre is mordanted, that is, treated with one of the metallic oxides just mentioned, and then when immersed in the colour, the lake is precipitated in the fibre. The colouring matters are liable to change by exposure to daylight, they are also affected by a number of chemical reagents—certain blues, for example, are turned green by alkalies, and red by acids—they are destroyed by nitric acid, bleached by chlorine, decolorized, but not always permanently destroyed, by sulphurous acid and sulphuretted hydrogen, &c.

Of the colouring matters the yellows are the most abundant, and different varieties are got from different plants: fustic, turmeric, quercitron, Persian berries, morindin, saffron, annatto, purree, chrysophanic acid, and others; of the blues indigo and litmus are the most familiar; and of the reds and purples, madder, logwood, Brazil-wood, safflower, and a few more. Most of these colours require complicated operations to separate them in the pure state.

The only green colouring matter known, of no importance as a dye but indispensable to the life of the plant, is chlorophyll. It was formerly supposed that this is a single substance which could be obtained from an alcoholic extract of leaves by adding lime, then decomposing the lime-chlorophyll compound with an acid, and agitating with ether, from which the chlorophyll was got by evaporation. But by another process it was found that it could be separated into two bodies, one yellow, the other blue; and by the application of the spectroscope, Stokes showed that chlorophyll contains four colouring matters, two yellow and two green, differing in optical properties. By further study in the same direction Mr. Sorby thinks he has proved that besides the greens there are four or five distinct yellow colouring matters, to which he has given special names. It is quite obvious, if this be so, that our knowledge of the nature of chlorophyll is just beginning, for each colouring matter will become an object of chemical and physiological investigation, and not till then will it be possible to say how chlorophyll acts in a plant. Experiments have been recently tried to elucidate more precisely the fading of chlorophyll when exposed to light, a change which is accompanied by altered spectrum bands, but in their present state they are too incomplete for description here.

The animal colouring matters are found mainly in the three fluids, bile, blood, and urine. The biliary colouring matter, or *cholochrome*, as it is called, has been much investigated, and with results similar to those in the case of chlorophyll, to wit, the isolation of a number of distinct bodies with different chemical properties and different absorption spectra. The names given to them are *bilirubin*, an orange-yellow powder, soluble in chloroform, benzol, and alkalies; *biliverdin*, a green powder, insoluble in chloroform, but soluble in alcohol; *biliprasin*, a black mass, of a dark green colour when powdered, insoluble in chloroform, soluble in alcohol and in alkalies; it is produced spontaneously from the preceding when dissolved in an alkali and exposed to air; *bilifuscin*, a black mass, of a dark brownish-green colour when powdered, slightly soluble in chloroform, readily in spirit. These different bodies exhibit different reactions with acids and metallic salts, and by decomposition yield other colouring matters. Other chemists have got bilirubin as a bright red colouring matter by direct action of chloroform, and besides a brown modification called *biliphœin*. The same uncertainty, therefore, prevails regarding the bile pigments as is the case with the vegetable colours, the uncertainty being due to the similarity of the bodies and the difficulty of separating them from one another, and also to the possible decomposition of the bodies themselves by the action of the solvents.

The colouring matter of blood will be found described under HÆMATOCRYSTALLIN, and of urine in the article on that subject.

The artificial colouring matters may be divided into two classes, those which exist ready formed in nature, as many of the common red and brown paints, or which are formed by the mechanical mixture of such naturally existing colours, and those which do not exist in nature but are produced by chemical operations. The latter are of mineral or of organic origin, examples of the first class being afforded by Scheele's, Guignet's and other greens, artificial ultramarine, smalt, and many others, and of the latter by Prussian blue, and especially by the aniline colours. The artificial colours will be more particularly described in the articles DYEING and PIGMENTS.

COLT'S-FOOT (*Tussilago farfara*), a plant belonging to the natural order Compositæ, with radiate flowers, that is, flowers of which the outer florets of each head are strap-shaped, and the central ones tubular. It has a perennial creeping root, the greater portion of which is in part an underground stem or root-stock, remarkably tenacious of life, and capable of reproducing the plant if the smallest portion having an eye or bud is left in the soil. From the root-stock there arise in spring several simple cottony flower-stems, bearing several short, alternate, scale-like leaves, and a single head of flowers. The involucre consists of a single row of linear scales. The recep-

tacle has neither scales nor bristles among the florets. The florets are very numerous, all yellow, most of them very narrow, linear, and a little longer than the involucre, with a few tubular barren florets in the centre. The achenes or seed-vessels of the linear florets are cylindrical, with a pappus of long silky hairs; those of the tubular florets are barren, with a shorter pappus. Later in the season the same root-stock sends up three or four broad angular leaves, deeply notched at the foot-stalk, green and smooth on the upper surface, and covered underneath with a white cottony wool, sometimes used as tinder.

COLT'S REVOLVER. See REVOLVER.

COLUBER, a genus of non-venomous serpents, having the mastoid bones detached from the skull, a forked and very extensible tongue, a cylindro-conical tail furnished underneath with a double row of plates. The top of the head is covered with from nine to twelve scales larger than those of the rest of the body. The belly is covered with entire epidermal plates, and there are no anal spurs. This genus of Cuvier includes a very large number of species, and has therefore been divided into numerous sub-genera by naturalists who have specially studied this group of reptiles. The genus Coluber of Linnæus was still more extensive, including both venomous and non-venomous reptiles, and only distinguished by the double row of plates under the tail. The most common member of this genus throughout the greater part of Europe, and the only British species, is the common ringed snake (*Coluber natrix*), which attains a length of 3 feet or more in the male, and a still greater length in the female, although individuals of the species are found only one-half or one-third of that length. It is distinguished by a collar of yellow spots, sometimes very pale, round the neck. It is found in moist places, where it lives on frogs, rats, &c. Another species is the *Coluber Æsculapii*, common in the neighbourhood of Rome, and regarded as the serpent of Epidaurus which was sacred to Æsculapius. It is the same serpent which on the occasion of a pestilence in Rome in the time of the Punic wars was brought into the city and worshipped on the Isle of the Tiber. Its length is from 3 to 4½ feet.

COLUMBA. See CALUMBA.

COLUMBA, ST., a native of Ireland, where he is supposed to have been born about 521, founder of the monastery of Icolmkill. It was probably in 563 that he visited Scotland and was favourably received by the King Bridius, who gave him the Isle of Hy, now called Iona, where he established his famous seminary in 565. His object was to Christianize the Pictish tribes living to the north of the Grampians, those dwelling to the south of that range having previously had Christianity preached to them by St. Ninian and his followers in the fifth century, while the Scots living in the islands on the west and the western coast of Scotland had been already Christianized before crossing over from Ireland, or had received Christianity at a subsequent period before the time of St. Columba. After establishing the monastery on the island of Hy, Columba appears next to have gone in pursuit of his object to Aberdour in Buchan in Aberdeenshire, and thence to have traversed the whole of Northern Scotland preaching the Christian faith and founding monasteries, all of which he made subject to that which he had set up on the island of Hy. He is said to have died in 597. The Vita Sancti Columbæ was written by St. Adamnan, abbot of Iona. The best edition is that printed at Dublin for the Bannatyne Club in 1857, edited by Dr. Reeves.

COLUMBANUS, a missionary and reformer of monastic life, born in Ireland apparently about 540, became a monk in the Irish monastery of Benchor (Bangor), went through England to France with twelve other monks to preach Christianity, and founded the monasteries of Annegray, Luxeuil (590), and Fontaine in Burgundy. His rule, which was adopted in latter times by many monasteries in France, commands blind obedience, silence, fasting, prayers, and labour, much more severe than the Benedictine rule, and punishes the smallest offences of the monks with stripes. He retained also the old ecclesiastical customs of the Irish, among which is the celebration of Easter at a different time from the Romish Church. He appears to have remained at Luxeuil for nearly twenty years, but in the end the boldness with which he rebuked the vices of Thierry, king of Burgundy, led to his banishment at the solicitation of Queen Brunehaut. He then went among the heathen Alemanni, and preached Christianity in Switzerland. His companion Gall (that is, Gallus, founder of the monastery St. Gall) obstructed his success by his violence in destroying the monuments of the heathens, till a war, in 612, put a stop to his labours. Columbanus then went into Lombardy, and founded the monastery of Bobbio, in which he died in 615. His intrepid, violent, and heroic spirit is displayed in his letters to the Popes Gregory I. and Boniface IV., in which he refused to celebrate Easter with the Romish Church, warned the popes against heresies, and represented in a strong light the corruption of the church. His services in reforming the monastic discipline, and the number of his miracles, caused him to be canonized. His writings are few, and of the ascetic kind. His rule was observed longest in the large rich monastery of Luxeuil, and was not supplanted till the ninth century by the Benedictine. The habit of his monks was white. See BENEDICTINES.

COLUMBARIUM (Latin), in ancient architecture, a pigeon-house or dove-cot. *Columbarium fictile*, an earthen pot for birds to breed in. *Columbarium* was also the name given to a subterranean sepulchre having niches in the walls to receive the urns containing the ashes of the dead.

COLUMBIA, a town in Richland county, South Carolina, situated on an elevated plain on the left bank of the Congaree, the seat of the state government; pop. in 1870, 9298. It is regularly laid out. The streets intersect each other at right angles, and are 100 feet wide. The South Carolina College was founded here in 1802. It is under the liberal patronage of the state, from which it has received annually a large grant.

COLUMBIA, BRITISH. See BRITISH COLUMBIA.

COLUMBIA, DISTRICT OF, a small tract of country on the east side of the Potomac, about 120 miles from its mouth, ceded to the United States by Virginia and Maryland in 1790. The district then ceded was about 100 square miles. By an act of Congress in 1846 the city and county of Alexandria, which long formed a portion of Columbia, were retroceded to the state of Virginia; so that the district is now confined to the Maryland side of the Potomac, an area of 55 square miles. The district is under the immediate government of Congress. The city of Washington, in the district of Columbia, became the seat of government of the United States in 1800. Pop. of the district in 1870, 131,700, of whom 88,278 were whites. Pop. of city of Washington, 109,199.

COLUMBIA RIVER, a large river of North America, which rises in the Rocky Mountains, and, after a course of about 1500 miles, flows into the Pacific Ocean, forming in the last part of its course the boundary between Washington and Oregon territories. Its principal tributaries are Flat Bow River, entering it in British America, Clarke's River, and

Lewis or Snake River, all on its left bank. At the point of the junction of Lewis River the Columbia is 960 yards wide. The tide flows up 183 miles, to within 7 miles of the Great Rapids. Above the rapids the navigation is good for 65 miles, when it is interrupted by the 'long narrows;' and 6 miles higher up, that is 261 miles above the mouth of the river, it is interrupted by falls of 20 feet perpendicular; above the falls the navigation continues good to the junction of Lewis River. The portages around these obstructions of the navigation amount in all to 5 miles. The entrance into the river and the egress out of it are difficult at all seasons, and from October to April extremely dangerous. The first modern navigator that entered this river was Captain Gray, of the ship *Columbia*, of Boston. He entered it in 1792, and since that time the river has been known by the name of *Columbia*. It was before called the *Oregon* and *River of the West*.

COLUMBIDÆ, the pigeon family, a family of birds belonging to the order Rasores, or Scrapers. In this family the bill is short, vaulted in the anterior part, and contracted about the middle; the nostrils are oblong, opening almost at the middle of the bill, in a cartilaginous scale; the toes are four in number, and unconnected at their base, but furnished with a thick membrane underneath which overlaps them laterally; the hallux or hind toe is at the same level as the other three, and rests on the ground throughout its whole length; the wings are of medium length or short; the tail feathers number twelve to fourteen. The Columbidæ were ranged by Cuvier among the Gallinacei; but they differ from the true Gallinacei in habits as well as in structure. The latter are polygamous; the male does not nourish the female while hatching, nor does it assist in incubation; they fly badly, and seek their nourishment on the ground; they seldom build their nests on trees; and their anterior toes are united at the base by a short membrane. The Columbidæ, on the other hand, are monogamous; they fly well, and generally build their nests on trees; their toes are entirely free; the male assists the female in building the nest, and also in incubation. The brood of the Columbidæ usually consists of only two eggs, but there are several broods in the year. The young are almost helpless at their birth (although the young of the Gallinacei are generally able to walk). They are at first covered with a fine down, and do not leave the nest until they are furnished with feathers. Until that period they are nourished by their parents, the food which is supplied to them being softened by a milky fluid which is secreted in the double crop, which is an expansion on each side of the gullet peculiar to the Columbidæ. The food of this family consists chiefly of seeds and berries, although they sometimes eat snails or insects. When they drink it is by a single draught, although the Gallinacei raise the head every time they swallow.

COLUMBINE (*Aquilegia*), a genus of plants belonging to the natural order Ranunculaceæ, distinguished from the genus *Aconitum*, to which it is most nearly allied, by the shape of the five petals, which are tubular and two-lipped, and have curved spurs at the base. The five sepals of the calyx are flat, and resemble petals in their colour. The flowers of the columbine are mostly blue or purple, seldom white or red, and each flower produces five many-seeded capsules. The commonest species is the *Aquilegia vulgaris*, which is found throughout Europe. It is often cultivated as a garden plant. Columbine is so called from the fancied resemblance of the flowers to a cluster of pigeons (*columba*, Latin, a pigeon).

COLUMBUS, the name of several towns in the United States:—1. A town, Mississippi, capital county Lowndes, 132 miles N.E. of Jackson, left bank of Tombigbee. It has a courthouse, jail, two banks, a theatre, several churches and educational establishments, and a market-house. Pop. in 1870, 4812.—2. A town, Georgia, capital county Muscogee, left bank of Chattahoochee River, immediately below the falls, 240 miles W. by N. of Savannah. It is regularly built, with broad spacious streets, crossing at right angles; and has a courthouse, several churches, schools, and academies; a paper, five cotton and several flour mills, and two iron-foundries. Pop. in 1870, 7401.—3. A town, Ohio, seat of government of the state, in Franklin county, on the east bank of the Scioto, near the centre of the state; pop. in 1870, 31,274. Standing on an alluvial flat it presents nothing attractive in its site. Its most striking feature is the number and extent of its public buildings and institutions. The capitol is second in size only to that of Washington, and is built of gray limestone in the simple Doric style. There are a German Lutheran theological seminary, a medical college, lunatic, blind, and deaf and dumb asylums, and a penitentiary. The ample means of communication, both by water and rail, give Columbus a very extensive trade, and make it the entrepôt for the produce of the district.

COLUMBUS, CHRISTOPHER (in Spanish, *Christoval Colon;* in Italian, *Cristoforo Colombo*, which is his real name), one of the greatest men mentioned in history, was born in Genoese territory, probably between 1430 and 1450. The year 1436 is that given by Navarrete, Humboldt, and others; 1447, that given by Robertson and others; while numerous other dates are given by other authorities. The place of his birth is as uncertain as the year, several towns in Genoese territory (among others Genoa itself) and at least one town out of it, claiming the honour; but it seems to be established that the last claim at least is unfounded. His father, Domenico Colombo, a poor wool-comber, gave him a careful education. He soon evinced a strong passion for geographical knowledge, and an irresistible inclination for the sea. The details of his early life are confused and unsatisfactory. He appears to have gone to sea at an early age, and to have navigated all parts of the Mediterranean and some of the coasts beyond the Straits of Gibraltar. In 1470 we find him at Lisbon, where he married the daughter of Bartolommeo de Palestrello, a distinguished navigator, who had founded a colony in Porto Santo, recently discovered, and had left many charts and nautical instruments. Columbus made use of these materials, and his opinion that the other side of the globe contained land, belonging to eastern Asia and connected with India, which was, as yet, little known, became more and more fixed. Whilst the Portuguese were seeking to reach India by a south-east course round Africa, he was convinced that there must be a shorter way by the west. He applied in vain to his native city, Genoa, for assistance, and equally fruitless were his endeavours to interest John II. of Portugal in the enterprise. He then determined to apply to the Spanish court. His brother Bartolommeo sailed for England, but was captured by pirates. Columbus explained his plan to Ferdinand and Isabella of Spain, and after an eight years' struggle with the obstacles thrown in his way by ignorance and malice, he received three small vessels called *caravels*. These three vessels were named the *Pinta*, the *Niña*, and the *Santa Maria;* and according to Jal each of them was fully decked and had four masts and a crew of ninety men.

The dignity of high-admiral and viceroy of all the countries he might discover was conferred on him, the former to be hereditary in his family. A certain share of the profits was secured to him by a written contract with the sovereigns.

It was early in the morning of Friday, on the 3d of August, 1492, that Columbus set sail from the port of Palos. Eighteen years had elapsed since he had first conceived the idea of this enterprise. Most of that time had been passed in almost hopeless solicitation, amidst poverty, neglect, and ridicule; the prime of his life had been wasted in the struggle. Nor should it be forgotten that it was to Isabella alone that he was finally indebted for the means of executing his project, which had been coldly rejected by the prudent Ferdinand. Having provided himself at the Canary Islands with fresh water, he sailed south-west into an ocean never before navigated. But when twenty-one days had elapsed without the sight of any land, the courage of his men began to sink. It was certain, they said, that they should perish, and their visionary commander ought to be forced to return. Some of them even proposed to throw him overboard; and Columbus had to exert all the powers of his daring and commanding spirit to prevent an open rebellion. A phenomenon, which surprised even him, filled his pilots with consternation: the needle deviated a whole degree. But the sea appeared suddenly covered with grass, and again showed symptoms of shoals and rocks. Numbers of birds were also seen. Columbus sailed in the direction from which they flew. For some days the voyage was continued with revived courage, until at last the dissatisfaction of the crews began to break out into open violence; but Columbus, after endeavouring in vain to pacify his men by promises, finally assumed a different tone, and told them it was useless to murmur; that he was determined to persevere. Fully convinced that he must be near the land, he promised a reward to whosoever should first discover it. On the night of the 11th and 12th of October Columbus himself descried a light which sometimes flickered in the distance and sometimes disappeared, and at two o'clock on the morning of the 12th a cannon-shot from the *Pinta* announced that a sailor belonging to that vessel had discovered land.

It was the island of Guanahani, which Columbus believed to belong to Eastern Asia and to be connected with India, a belief which he carried with him to his grave. Hence the mistaken name of *Indians* applied to the natives of America, and that of *West Indies* applied to the group of islands of which Guanahani forms one. On landing Columbus threw himself upon his knees and kissed the earth, returning thanks to God. The natives collected round him in silent astonishment, and his men, ashamed of their disobedience and distrust, threw themselves at his feet, begging his forgiveness. Columbus, drawing his sword, planted the royal standard, and in the name of his sovereigns took possession of the country, which, in memory of his preservation, he called *St. Salvador*. He then received the homage of his followers, as admiral and viceroy, and representative of the sovereigns. Being informed by the natives that there was a rich gold country towards the south, Columbus directed his course towards that region, and reached Cuba on the 28th October, and Española (Hispaniola, Hayti) on the 6th December; but as one of his vessels was wrecked, and the other separated from him, he resolved to carry the news of his success to Spain. Having built a wooden fort from the wreck of his vessel, he left in it thirty-nine volunteers, and set out on his return, January 4, 1493. The day after he left the island he met the *Pinta*, which had been missing. Both vessels were afterward nearly wrecked in a tremendous storm. Columbus, more interested for his discovery than for himself, wrote an account of his voyage on a piece of parchment, which he secured in a cask, and threw the whole overboard, in the hope that it might be carried ashore. He had hardly finished this work when the gale subsided. March 15, he re-entered the port of Palos amid the acclamations of the people, the thunder of cannon, and the ringing of bells. He hastened immediately to Barcelona, where the court then was, and entered the city in a triumphal procession, with the productions of the newly-discovered countries carried before him. A chair was placed for him next to the throne, and, seating himself, he gave an account of his discoveries. He was created a grandee, and all the marks of royal favour were lavished upon him.

September 25, 1493, he set sail from Cadiz with three large ships of heavy burden, and fourteen caravels, carrying 1500 men. On the 3d of November he discovered the island of Dominica, and afterwards Mariegalante, Guadeloupe, and Porto Rico, and on the 22d he arrived at Hispaniola. Finding the colony he had left destroyed, he built a fortified town, which he called, in honour of the queen, *Isabella*, and of which he appointed his brother Diego governor. He immediately left the island in order to make new discoveries, visited Jamaica, and returning after a voyage of five months, worn down with fatigue, found to his great joy that his brother Bartolommeo, who had escaped from his captivity, had arrived at Isabella with provisions and other supplies for the colony. Meanwhile a general dissatisfaction had broken out among his companions, who, instead of the expected treasures, had found hardships and labour. They set on foot many calumnies, and gave the most unfavourable description of the country and the viceroy. Columbus thought he could not better oppose these reports than by sending considerable treasures to his sovereigns, and for this purpose collected gold from the natives, which was not done without violence and some cruelty. Aguado, a personal enemy of Columbus, was sent as commissioner to investigate the complaints against the great discoverer, who, thinking it time to vindicate himself in the presence of his sovereigns, prepared to return to Spain. Having appointed his brother Bartolommeo *adelantado* or lieutenant-governor, he embarked for Spain in March 1496, with 225 Spaniards and thirty natives. In Spain calumny was silenced by his presence, and probably still more by his treasures. Yet his enemies were powerful enough to detain the supplies intended for the colony a whole year, and to retard the fitting out of a new expedition.

It was not till May 30, 1498, that he sailed with six vessels on his third voyage. To man these vessels criminals had unwisely been taken—a measure which Columbus himself had advised, and which had been taken up with great satisfaction by his enemies. Three of his vessels he sent direct to Hispaniola; with the three others he took a more southerly direction, for the purpose of discovering the mainland, which information derived from the natives induced him to suppose lay to the south of his former discoveries. He visited Trinidad and the continent of America, the coasts of Paria and Cumana, and returned to Hispaniola, convinced that he had reached a continent. His colony had been removed from Isabella, according to his orders, to the other side of the island, and a new fortress erected called St. Domingo, Columbus found the colony in a state of confusion. After having restored tranquillity by his prudent measures, in order to supply the deficiency of labourers he distributed the land and the inhabitants, subjecting the latter to the arbitrary will of their masters, and thus laying the foundation of that system of slavery which has lasted down to our time. His enemies, in the mean time, endeavoured to convince his sovereigns that he had abused his power, and that his plan was to make himself independent, till at

last even Isabella yielded to the wishes of Ferdinand, who had previously become convinced of the truth of the slanders. Francisco de Bobadilla was sent to Hispaniola, with extensive powers, to call the viceroy to account. As soon as he reached the island he summoned Columbus to appear before him, and put him in irons. His brothers were treated in the same manner. All three were sent to Spain, accompanied by a number of written charges, drawn up from the statements of the bitterest enemies of Columbus. Columbus endured this outrage with noble equanimity, and wrote, as soon as he had arrived in Cadiz, November 25, 1500, to a lady of the court vindicating his conduct, and describing in eloquent and touching language the treatment he had received. The fetters with which he had been bound he kept to the day of his death, and his son Hernando states that he even ordered that they should be inclosed with him in his coffin. Orders were immediately sent directing him to be set at liberty, and inviting him to court, where his sovereigns received him with the same distinction as formerly. Isabella was moved to tears, and Columbus, overcome by his long-suppressed feelings, threw himself upon his knees, and for some time could not utter a word for the violence of his tears and sobbings. He then defended himself by a simple account of his conduct, and was reinstated to his dignities. Ferdinand even consented to dismiss Bobadilla, which was intended for the first step towards the promised restoration of the great discoverer in his dignities. But these dispositions in the monarchs were soon changed. There was much talk of great expeditions, and in the mean time Nicolas de Ovando y Lares was sent as governor to Hispaniola. Columbus still urged the fulfilment of the promises solemnly made to him; but after two years of delay he became convinced that there was no intention to do him justice.

But his noble mind had now learned to suffer, and he was principally desirous of completing his work. Supposing the continent which he had seen to be Asia, he did not doubt that he should find, through the Isthmus of Darien, a way to the East Indies, from which the first fleet of the Portuguese had just returned richly laden. In four slender vessels supplied by the court for this purpose Columbus sailed from Cadiz on his fourth and last voyage, May 9, 1502, with his brother Bartolommeo and his son Hernando; arrived contrary to his original intention off St. Domingo, June 29, and was denied permission to enter the port for the purpose of refitting his vessels, and escaping an approaching storm. He succeeded, however, in anchoring his small squadron in a place of safety, and rode out the storm, whilst a fleet of eighteen vessels, which had put to sea in spite of his warning, was almost entirely destroyed. He then continued his voyage to Darien, but without finding the expected passage. Two of his vessels were destroyed by a gale; the two others were wrecked off Jamaica, where he was scarcely able to save himself and his companions. Here the severest trials awaited the constancy of Columbus. Separated from the other part of the world, his destruction seemed to be certain. But he succeeded in procuring a few canoes from the natives, and prevailed on some of his boldest and best men to attempt a voyage to Hispaniola, in two canoes, in order to inform the governor of his situation. Several months elapsed without a glimpse of hope. Part of his companions, reduced to despair, rebelled, repeatedly threatened his life, separated from him, and settled on another part of the island. Here they alienated the minds of the natives by their cruel treatment, so much that they ceased to bring them supplies. The death of all seemed inevitable; but Columbus, whose courage rose with the danger, preserved his men in this crisis. He had ascertained that a total eclipse of the moon was about to take place, and threatened the natives with the vengeance of his God if they should persist in their enmity. As a proof of his assertion the moon, he said, would lose its light, in token of the chastisement which awaited them. When they beheld his threat verified they hastened to bring him provisions, and implore his intercession with the Deity. But hostilities now broke out between him and the rebels, in which several of the latter were killed, and their leader was taken prisoner. After remaining a year on the island, relief at last appeared. The two canoes had reached Hispaniola in safety, but the messengers could not prevail on the governor to undertake the deliverance of the admiral. They finally bought a vessel themselves, and it was on board this ship that Columbus left Jamaica, June 28, 1504. He went to St. Domingo, but only to repair his vessel, and then hastened back to Spain. He arrived in Spain sick and exhausted. The death of the queen soon followed, and he urged in vain on Ferdinand the fulfilment of his contract. After two years of illness, humiliations, and despondency, Columbus died at Valladolid, May 20, 1506. His remains were transported, according to his will, to the city of St. Domingo, but on the cession of Hispaniola to the French, they were removed in January, 1796, with great pomp, to the cathedral of Havannah in Cuba. A splendid monument was erected in honour of him, in a Carthusian convent at Sevilla, where his body was deposited, after being removed from the church of Santa Maria la Antigua, at Valladolid, and before being transferred to St. Domingo.

In the vigour of manhood Columbus was of an engaging presence, tall, well formed, and muscular, and of an elevated and dignified demeanour. His visage was long, his nose aquiline, his eyes light gray, and apt to enkindle. His whole countenance had an air of authority. Care and trouble had turned his hair white at thirty years of age. He was moderate and simple in diet and apparel, eloquent in discourse, engaging and affable with strangers, and of great amiableness and suavity in domestic life. His temper was naturally irritable, but he subdued it by the benevolence and generosity of his heart. Throughout his life he was noted for a strict attention to the offices of religion; nor did his piety consist in mere forms, but partook of that lofty and solemn enthusiasm with which his whole character was strongly tinctured. Of a great and inventive genius, a lofty and noble ambition, his conduct was characterized by the grandeur of his views and the magnanimity of his spirit. For further information respecting the life of Columbus we refer the reader to the short but interesting biography of Columbus by his son Hernando, in Barcia's Historiadores Primitivos (vol. i., Madrid, 1749); the diary of the first voyage, written by Columbus himself, and contained in the first and second vols. of Navarrete's Viages de los Españoles (5 vols., Madrid, 1825–37); the Vita di Colombo, by Bossi (Milan, 1818); and A History of the Life and Voyages of Christ. Columbus, by Washington Irving (Lond. 1828). The disputed points in his life are discussed by Humboldt in his Examen critique de l'histoire de la Géographie, &c. (1835–38); and in Spotorno's Codice Diplomatico Colombo-Americano (Genoa, 1823).

COLUMELLA, Lucius Junius Moderatus, the most learned practical writer on agriculture among the ancients; born at Cadiz in Spain; lived about the middle of the first century, and wrote twelve books which are still extant, one of which, on gardening (De Re Rustica), is in verse. He treats in this work of all the branches of agriculture. He also wrote a

book on the cultivation of trees. The best edition is by Gesner, in his collection Scriptores Rei Rusticæ (Leipzig, 1735, two vols. 4to).

COLUMN (Latin, *columna*), in architecture, a round pillar. In the earliest periods of the world the column was merely the trunk of a tree, or its imitation in stone, used to support the roof. The parts of a complete column are its *base*, on which it rests; its body, called the *shaft;* and its head, called the *capital*. Columns are used to support the entablature of an order, which has also its proper division. In the most ancient times columns of wood were the most usual, as being the most easily wrought. In countries like Egypt, where timber fit for construction is scarce and stone abundant, the latter became the principal material for columns, and those of Egypt are remarkable for the beauty of their workmanship and the durability of their materials. The Egyptian columns were numerous, close, short, and very large. They were generally without bases, and had a great variety of capitals, from a simple square block ornamented with hieroglyphics, or faces, to an elaborate composition of palm-leaves, not unlike the Corinthian capital. (See the view of the temple at Tentyra in Pl. IX.) The Greeks, for their columns, used marble of the finest kind, with which their country abounded; and other nations the stone or material of their country. The Greeks properly considered the column as an essential part of the architecture of their temples, and never used it as a mere decoration. The manner of constructing the columns of all the orders rests upon similar principles. They are all divided into three primary parts or divisions, the base, the shaft, and the capital, except the Doric order, which has no base. The lowest or thickest part of the shaft is used by architects as the universal scale or standard whence all the measures which regulate and determine heights and projections are taken; and this standard or scale must be understood before any architectural design can be commenced. The universal architectural scale is called a diameter, and is the diameter of the lowest or the largest part of the column; and, unlike the foot, inch, or yard, is as various as the size of columns. By the diameter, of course, is meant that of the circle which forms the bottom of the column. Half of this diameter, or the length of the radius which forms the circle, is called a *module*, and is used as well as the diameter as a primary standard of mensuration by some writers upon architecture. These measures of length are subdivided as follows, namely: the diameter into sixty parts, and the module into thirty parts, each part being the same in length, and called a minute. Both mensurations are the same, only under different denominations; as, for instance, one author says a column, which always includes the base, shaft, and capital, is six diameters, twelve minutes high; while another would say of the same column and its admeasurements that it is twelve modules and twelve minutes, both meaning the selfsame dimension. The *Doric* column has no base. The *Ionic* column has one peculiar to itself called the *Attic*, which, with that of the *Corinthian* order, is described under the article ARCHITECTURE—Grecian Style. The shafts of the different orders differ in height, and even in various examples of the same order. The capitals are also as various. Columns are either plain or fluted, and the flutes and manner of dividing them are different in the Doric and Corinthian orders. The Ionic flutes much resemble the Corinthian, and in many instances are exactly similar. Columns of all the orders taper gradually towards the top, but in the middle there is generally a slight swelling called an entasis. Roman architecture being derived from the Greek, Roman columns were either exactly similar to Greek ones or modifications of the latter. The principal modifications of the column made by the Romans were that form of the Ionic capital in which there were four pairs of diagonal volutes instead of two pairs of parallel ones, and that peculiar to the Composite order, in which the capital of the Corinthian column was combined with that of the diagonal or modern Ionic.

Columns are also often used for commemorative purposes as well as for architectural supports; like the Trajan and Antonine columns in Rome, and that called the *Monument* in London. Of modern columns, the last mentioned, which was erected in commemoration of the great conflagration of 1666, is one of the loftiest, the best constructed, and the most beautiful. It is a Doric fluted column, 202 feet high from the bottom of the pedestal, which is ornamented with bass-reliefs of Charles II. and his court giving protection to the fallen city, and various inscriptions, to the top of the vase of flames, by which it is surmounted.

COLUMN, in military tactics, a deep, solid mass of troops, formed by placing several bodies of men behind each other (sections, platoons, companies, squadrons, and even several battalions). The column is either an open or a close one. When a battalion is formed in open column, room enough is left between the companies for them to wheel into line. When the distance left between the companies is very small, the battalion is said to be formed in close column. And when the distance is intermediate between that in close and that in open column, it is said to be formed in half-distance column, and may be formed either for marching or for attack. By means of columns it is possible to march in places where it would be impracticable to move with unbroken lines. They also increase the force and steadiness of troops, both in attack and defence. The drawing up of the infantry in line is advisable, where there is no obstacle in the ground to prevent advancing in this order, or when the enemy is to be received with the fire of musketry, and where cannon-balls and grenades are more to be feared than case-shot and musketry. The order in mass is to be preferred when you have to move in a broken or hilly country, where a charge is intended, in which physical force, given by the depth of the column, is necessary, and the fire of the enemy is to be avoided as much as possible (which, on account of the small breadth of the column, is comparatively ineffectual), and also where a charge, particularly of cavalry, is apprehended. Though a cannon-ball, and still more a grenade, in the midst of the mass, causes a greater havoc, the probability of being hit is diminished on account of the small front exposed. An objection to columns, founded on the difficulty of moving so dense a mass, and of changing it into a line, has been removed in modern times by the practice of making the columns consist of only one battalion, and by disposing these single battalions near each other in such a way as to support one another by their fire, instead of arranging them uselessly behind each other. By the usual way of forming the columns towards the centre, those have received such a mobility and facility of development, that a line may be restored in two or three minutes. The charge in close columns, which is in use particularly with the French, is of the greatest effect when it succeeds; but when it fails the whole body of assailants is exposed to annihilation or to rout, as no support, no development, nor orderly retreat is possible. The attack with columns at some distance from each other has this advantage, that if the first division fails the subsequent ones may succeed; moreover, the facility of manœuvring is much greater. This mode of attack is particularly advisable in assaulting squares of infantry. March-

ing and fighting in lines, however, are the modes usually practised by cavalry.—*Column-roads* are such roads as may be passed with all kinds of arms: when the ordinary road is ruined, they are laid out across the fields and marked by poles with straw (*jalons*).

COLYTON, a small town, England, county Devon, in a beautiful valley, on the Coly (from which it takes its name), near its junction with the Axe, and 20 miles E. of Exeter. It has very irregular streets, kept, however, very clean. Many of the houses are respectable; but the cottages of the poor are built of *cob*, a mixture of trodden clay and chopped straw. It has a parish church with a tower, and two neat chapels; a free school, and several local charities. Manufactures:—Honiton lace, which gives employment to a number of women and children; paper, and leather. The inhabitants are chiefly engaged in agriculture. Pop. 2446.

COLZA OIL. This oil, familiar from its use as an illuminating agent in the Moderator and other lamps, is expressed from the seeds of *Brassica campestris oleifera*, and from allied species. It is yellowish-brown, has a specific gravity ·92, has little or no smell, dissolves in hot alcohol and in ether. It becomes thick and solid only at very low temperatures; when heated it volatilizes, but not completely, undergoing partial decomposition. It is purified for use by continued agitation with sulphuric acid, which destroys mucilaginous matter from the seed, and washing with water to remove all trace of the acid. By saponification it yields an acid called *brassic acid*, identified by some with an acid from oil of mustard, though they seem different. The oil is largely used both in this country and on the Continent in soap-making, tanning, fulling of cloth, lubricating machinery, and for burning. For the last it is so well adapted that it has been specially recommended for lighthouse purposes. It is brilliant and steady, is managed with very little attention, and is cheap. In these respects it is said to be superior to spermaceti.

COMACCHIO (ancient *Comactium*), a town, Italy, province and 29 miles E.S.E. of Ferrara, amidst unhealthy marshes, about 2 miles from the Adriatic. Salt is manufactured here to the extent of above 2,000,000 lbs. annually, and productive fisheries, especially of eels, are carried on in the neighbouring lagoons. It is the seat of a bishopric. Pop. 6475.

COMANCHES, an American Indian tribe in Mexico and Texas, who roam along the prairie ground beyond the Puercos and Rio Grande del Norte. They are extremely warlike, and make regular organized inroads, for the sake of plunder, into the Mexican territories, especially into Durango and Chihuahua. In some respects the Comanches differ from other Indian tribes; but the only ground of difference calling for particular notice is their aversion to ardent spirits, it being extremely difficult to induce any of them to taste a drop of intoxicating liquor. Their numbers are estimated at 10,000.

COMAYAGUA, or VALLADOLID-LA-NUEVA, the capital of the Republic of Honduras, situated on the southern border of the plain of Comayagua, on the left bank of the Ullua River, 220 miles E. of Guatemala. It is the seat of a bishopric, has a large and handsome cathedral, a richly endowed hospital, several convents, and a college. Pop. about 8000. It was founded by Alonzo Caceres in 1540, and up to 1827 was a thriving prosperous place, and contained about 18,000 inhabitants. In that year, however, it was burned by the monarchical faction of Guatemala, and has never recovered its former condition.

COMB (*camb*, Saxon), an instrument to separate and adjust the hair, too well known to need description. We have no certain authority, either from busts or medals, that either the Greek or the Etruscan women used this useful and ornamental appendage to their hair; although it was used by the Greek women at least to arrange their hair. The combs used by the Greeks were of box-wood, and had teeth on both sides, while those used by the Egyptians had teeth only on one side. The Romans also had combs of box-wood, and at a later time probably of ivory and other materials. In the work of Guasco Delle Ornatrici, there are several representations of ancient Roman combs. One of them is a long one of box, of which the handle is overlaid with ivory, and appears to have been ornamented with a small meander in gold. It has two rows of fine teeth, delicately wrought and well proportioned. In making combs the material is first cut to the form which the comb is to have, and the teeth are then made all at once by means of circular saws mounted on the same axle and placed at a suitable distance from one another. Large combs in horn or shell, with wide teeth, are sometimes made with a punch, which cuts in the piece the teeth of two combs by the same operation. The teeth are afterwards finished with the file. Combs made of vulcanized india-rubber, which are now so common, are made by pressing the caoutchouc while soft into moulds, and then bringing them to the desired degree of hardness by the process of vulcanization. Canova and other modern sculptors have made great use of the comb in their female busts, to which they add much grace and elegance.

COMBACONUM, a town, Hindustan, in the Carnatic, 20 miles E. of Tanjore, with about 40,000 inhabitants. It was the ancient capital of the Chola dynasty, from which the whole coast, called Coromandel, by corruption from Cholamandel, received its name. Being regarded by the Hindus as a place of peculiar sanctity, it is inhabited chiefly by the Brahmans, and contains numerous pagodas and tanks with water, supposed to be of purifying efficacy. It is one of the strongholds of Brahmanism, but a considerable number of the inhabitants are Roman Catholics, and a Protestant mission has been successfully established.

COMBAT, in law, or single combat, denotes a formal trial between two champions, of some doubtful cause or quarrel, by the sword or batoon. This barbarous way of deciding controversies was, in the middle ages, very common, not only in criminal but also in civil causes. The form and ceremony of the combat are described in the Grand Coutumier of Normandy. The accuser first swore to the truth of his accusation; the accused gave him the lie; upon which he threw down a pledge of battle, and the parties were committed to prison till the day of combat. The legal combat belongs to the same class of absurdities as the formal trial of witches. It was abolished by 59 George III. cap. 46. See DUEL and CHAMPION.

COMBE, ANDREW, born at Edinburgh in 1797, was educated at the High School there, and afterwards completed his medical course at the university. His brother, George Combe, had previously become a zealous advocate of phrenology, and Andrew, before he had completed his twentieth year, had become a convert to the same system. In 1817 he went to Paris, attended the lectures of Dupuytren, and other eminent professors, and made the acquaintance of Spurzheim, who strongly confirmed him in his phrenological views. In 1822 he commenced practice at Edinburgh, and had considerable success, particularly among those who shared in his phrenological opinions. These opinions he continued strenuously to defend in papers printed in the Transactions of the Phrenological Society, and afterwards in contributions to the Phrenological Journal, of which he was one of the founders. In 1825 he took his degree

of M.D., and chose for his thesis The Seat and Nature of Hypochondriasis, which he afterwards published in an enlarged form. His writings had hitherto been confined to contributions to other publications or mere pamphlets; but in 1831 he made his formal appearance as an author by publishing Observations on Mental Derangement. This was followed in 1834 by Principles of Physiology. These works had a very extensive circulation, both in this country and in the United States of America. In 1836 he was appointed physician to the King of the Belgians, and in 1838 one of the physicians extraordinary to the queen in Scotland. In the interval between these appointments he published his Physiology of Digestion, which proved very popular. His last work, published in 1840, was entitled A Treatise on the Physiological and Moral Management of Infancy. In 1842 he was induced to go to Madeira for the benefit of his health, and this visit was so efficacious that he repeated it in 1843. He died 1847.

COMBE, George, brother of the foregoing, was born on 21st October, 1788, at Edinburgh. He was bred to the law, and in 1812 was admitted a member of the Society of Writers to the Signet. In 1816 the celebrated Spurzheim visited Edinburgh, and made numerous converts to the new science of phrenology as enunciated by him and Dr. Gall; among others George Combe, who enthusiastically embraced the theory and devoted all his energies to its propagation. In 1823, along with his brother, Dr. Andrew Combe, and a few friends, he established the Edinburgh Phrenological Journal. His celebrated work on the Constitution of Man, considered in relation to External Objects, was published in 1828, and created an immense sensation. In 1833 he married Miss Siddons, daughter of the celebrated actress of that name, but never had any family. He visited Germany in 1837, and in 1838 the United States, where he delivered numerous lectures on his favourite science. Besides phrenology, George Combe was a zealous promoter of the cause of popular education and social progress. Besides the Constitution of Man, he is the author of numerous other works; among which may be mentioned more particularly A System of Phrenology (1825); The Elements of Phrenology (1824); Moral Philosophy, or the Duties of Man, Individual, Domestic, and Social (1840); The Life and Correspondence of his Brother, Dr. Andrew Combe (1850); Lectures on Popular Education (1833); Principles of Criminal Legislation and Prison Discipline Investigated (1854); and the Relation between Science and Religion (1857). He died while on a visit to a friend at Moore Park, Surrey, on 14th August, 1858.

COMBERMERE, Sir Stapleton Stapleton-Cotton, Viscount, a distinguished English general, born in Denbighshire Nov. 17, 1773; died at Clifton Feb. 21, 1865. He entered the army in 1790, and first served in Flanders in 1791 and 1792. He was afterwards sent to India, where he took part in the Mysore war against Tippoo Saib in 1798 and 1799, and was present at the taking of Seringapatam in the latter year. With the rank of major-general he accompanied the Duke of Wellington to the Peninsula in 1808; and in 1809 he so distinguished himself at the battle of Talavera as to earn the thanks of Parliament. In 1810 he was appointed commander of the cavalry of the allies on their retreat from Almeida to Torres Vedras. At Salamanca, in 1812, he headed the brilliant cavalry charge which greatly contributed to the decisiveness of that victory, and for this he again received the thanks of Parliament. He was subsequently present at the battles of the Pyrenees, Orthez, and Toulouse, and shortly after the last battle he was raised to the peerage with the title of Baron Combermere. From 1817 to 1820 he was governor of Barbadoes; and in 1825 he was sent to India as commander-in-chief of the forces there, to put down the usurper Doorjun Sal. After a siege of less than two months Bhurtpore, the chief city of Doorjun, was taken by storm on the 6th Feb. 1826, for which Combermere was raised to the rank of viscount. This was the last occasion on which he was in active service, and the remainder of his life was passed in England. In 1852 he was appointed Constable of the Tower; and in 1855 he was made a field-marshal.

COMBINATION, in mathematics, is the variation or alteration of any number of figures, letters, colours, sounds, &c., in all the different manners possible. The parts combined are called *elements*.—The *doctrine of combination* is that branch of mathematics which teaches the results arising from all possible combinations, and gives rules respecting them. *Combinatory analysis* is the application of the doctrine of combination to analyses, and constitutes a branch of science often very involved. A system of characters is appropriated to this purpose. Hindenburg, of Leipzig, in 1778, gave it the character of an independent science; and it has been of important service in relation to the higher branches of mathematics. (See Weingartner's Lehrbuch der combinatorischen Analysis, Leipzig, 1801, two vols.) Permutations are those combinations in which, each time, all the elements are used, and the object is to determine how often they change their place, for instance, *a b c d*, *a c b d*, *b d a c*, &c. The number of possible combinations is found by multiplying the terms, 1, 2, 3, &c., continually into each other; thus, $2 \times 3 = 6$; $6 \times 4 = 24$; $24 \times 5 = 120$, &c. Thus the combinations of five quantities amount to 120. The changes that may be rung on twelve bells amount to 479,001,600; and the twenty-four letters of the alphabet admit of 62,044,840,173,323,943,936,000 changes or combinations.

COMBUSTION. In consequence of the combination of the carbon and hydrogen in fuel with the oxygen of the air being the universal method of getting heat and light, and as when the action takes place the fuel is said to burn or undergo combustion, the latter term has been extended to those cases in which other bodies than carbon—for example, phosphorus, sulphur, metals, &c.—burn in the air, or in other substances than air—for example, chlorine. It is, therefore, but a special case of chemical action which, partly on account of its frequency and importance, partly on account of its obviousness, has attracted greater attention than the more recondite but not less potent manifestations of the same force. It is besides of peculiar interest in the history of chemistry, because all along it was felt to be of great importance to understand in what combustibility actually consists. The older chemists ascribed to bodies a combustible principle which assumed different shapes at different epochs, but which continued till Lavoisier, towards the end of last century, pointed out the part which oxygen gas performs in the combustion of a body. One result of this was that the idea of a combustible principle quickly disappeared from chemical theory, and there grew up in its place a separation of bodies into combustibles and supporters of combustion, which is still retained in common language. The distinction, however, is accidental, for as it requires the concurrence of a member of both classes to produce burning, it is plain that each must be regarded as supporting the combustion of the other; and it is experimentally possible to reverse the ordinary conditions, and exhibit that body as the combustible which is usually defined as the supporter of combustion, and as a necessary con-

sequence the other acting as the supporter, which is usually regarded as a combustible.

For many years subsequent to Lavoisier his views were dominant, but increase of facts led to most important modifications of them. By degrees, combustion and oxygen, which was the chief element concerned, have lost their theoretical predominance, and have merged in ideas which are not limited to one set of actions, but which will ultimately attempt to comprise all the manifestations of chemical action in a general theory. See further the articles HEAT, LAVOISIER, METAL, OXYGEN, PHLOGISTON.

COMBUSTION, SPONTANEOUS, the ignition of bodies by the internal development of heat without the application of an external flame. It not unfrequently takes place among heaps of rags, cotton, and other substances strongly lubricated with oil, when, if the oil is freshly made, it is very ready to combine with the oxygen of the atmosphere, and give out carbon and hydrogen. The heat thus developed, diffusing itself through a mass of highly inflammable substances, will in certain circumstances be sufficient to set them on fire. A remarkable instance of spontaneous combustion occurring among hemp has been recently afforded as the cause of the terrible conflagration in Tooley Street, London. Bituminous coal, piled up in heaps, is apt to ignite by the decomposition of the sulphuret of iron which it contains. In ships laden with coal impregnated with sulphur and iron, in the form of bi-sulphuret of iron (pyrites), decomposition of this substance is sometimes occasioned by the access of moisture, and heat is evolved to such a degree as to cause the combustion of the coal, especially if air is admitted freely. Water poured upon the burning material only adds to the intensity of the action. The most singular instances, however, of spontaneous combustion are those of which human beings become the victims in their own persons. Those whom it has befallen have almost always been individuals grossly addicted to intemperance, fat, and advanced in years. The chemical changes producing this result are not well understood, and from the difficulties attending its explanation some eminent chemists, such as Liebig and others, have been led to reject the theory altogether as untenable, and maintain that none of the instances adduced are well authenticated. That such cases, however, have really occurred seems now to be pretty generally admitted. Among other hypotheses the origin of this dreadful phenomenon has been surmised to be owing to the development of phosphuretted hydrogen, which takes fire on coming into contact with atmospheric air, and may be formed and exhaled under certain conditions from the living body. The proximate cause of the ignition appears generally to have been some burning substance, such as a candle, the fire, or a spark from a tobacco-pipe. The flame in all cases of human combustion is described as being of a bluish colour, faint, and extinguished with difficulty by water, which even frequently seems to render it more active. It is always the trunk of the body which is first consumed, and the extremities are the last to be destroyed, contrary to what generally happens in ordinary cases of combustion.

COMEDY. See DRAMA.

COMENIUS, JOHANN AMOS, a benefactor of mankind by the improvements which he introduced into education, was born March 28, 1592, in Moravia. His parents, belonging to the Moravian denomination, had him educated at Herborn. In 1616 he received an appointment as teacher in Fulnek, on the plunder of which by the Spaniards after the battle of Prague, in 1620, he lost all that he possessed, including his books and manuscripts. After this he fled, in order to escape from the persecution of Protestants then raging, to Poland, where, in 1632, he was elected Bishop of the Moravian and Bohemian Brethren in Lissa. In 1631 he published, at Lissa, his Janua Linguarum reserata, a work which was translated into many European languages, also into Persian, Arabian, and Mongolian. In this he laid down a new system for teaching languages to children by the use of visible signs in order to facilitate the learning of words. His Orbis Pictus, or the Visible World, a republication of the Janua Linguarum reserata, with the addition of a large number of cuts representing natural objects, was first published, before 1660, at Nürnberg. In 1641 he was invited to England, in order to introduce a better organization into the schools; but as the civil war prevented the accomplishment of this plan he went to Sweden, where the chancellor Oxenstiern became his patron. In 1656 he returned to Lissa, where he once more lost all his books and manuscripts on the burning of the town after the retreat of Charles X. of Sweden. Comenius died at Amsterdam, or according to others at Naarden, Oct. 15, 1671. In the latter part of his life he gave himself up to religious dreams, after the fashion of that time, and revered Bourignon as a prophetess. Adelung gives the number of his works as ninety-two, but there are only fifty-four now extant.

COMETS. Of natural appearances, there are few that have been regarded with more superstitious apprehension than those bodies which occasionally appear in the sky, luminous, like the stars, but generally distinguished from these by a tail, or train of fainter light, bearing some resemblance to a tuft or lock of hair. Of this the Latin name is *coma*, and in consequence these bodies are called *comets*, to distinguish them from the other luminaries, which, whether near or remote, apparently fixed or movable, have not this train-like accompaniment. Comets are one of the three classes into which astronomers divide those celestial bodies that adorn the sky during the night. The stars, which retain their relative positions with regard to each other, and are at so great distances from the earth that the most perfect instruments measure only a few of them, are one class —and a class not apparently connected with our sun, or deriving light or heat from that luminary. The planets, which change their relative positions among the stars, and of which our earth is one, form the second class. They are solid bodies, and not luminous in themselves, but shine merely by reflecting the light of the sun. The masses of the planets, their magnitudes, and their motions, have been all determined with the greatest accuracy; and the place that any one of them will occupy at any proposed point of time can be calculated with ease by any one acquainted with practical astronomy. The planets are, in their motions, governed by one uniform law. In the early ages the planets were held to have certain influences upon individuals and nations. The comets, which are more singular in their form, and more varied in the times of their appearance, were still better adapted for superstitious purposes; and, accordingly, we find that their visits have been connected with the great, more especially the calamitous, events of nations. The appearance of a comet is, however, no more a prodigy, and has no more influence upon the fate of men or of nations than the appearance of the moon, or of a deciduous leaf upon a tree in spring. They are so distant, and either their motions are so rapid, or their substance is so rare, that none of them have been found to have any material action upon such of the planets as they have come near, although the planets have had a considerable influence upon them. What the comets are, or what purposes they serve in the economy of creation, we

do not know. As far as observation has gone, they are subject to the same laws as the planets, revolving in regular orbits or paths, with this difference, that their orbits are much more eccentric, or differ much more from circles, than the orbits of the planets; and thus, while they approach much nearer our system at one time of their revolutions, they recede correspondingly farther from it at another. The time since men had rational opinions on the subject has, however, been too short for verifying by observation the theory as applicable to the whole, or even the greater number of these bodies that have, from time to time, made their appearance.

Tycho Brahe was the first who expressed a decidedly rational opinion on the subject of comets. Finding, by careful observation, that the comet of 1577 had no diurnal parallax which he could detect—that is, that its place, when viewed from the surface of the earth, was not different from what it would have been if viewed from the centre; he properly concluded that its distance from the earth must be greater than that of the moon, in which this parallax was apparent to him. This was one step; and it was an important one: it removed comets to such a distance from the earth, that their use could not well be supposed to be for it, or their influence upon it very great. The general law of the motion of bodies in free space, as well as his own particular observations on the comet of 1680, led Newton to conclude that the orbits of the comets must, like those of the planets, be ellipses, having the sun in one focus, but far more eccentric; and having their *aphelions*, or greatest distances from the sun, far remote in the regions of space. The idea thus thrown out by Newton was taken up by Dr. Halley, who collated the observations which had been made of all the twenty-four comets of which notice had been taken previous to 1680. The results were abundantly curious; with but few exceptions, they had passed within less than the earth's shortest distance from the sun; some of them within less than one-third of it; and the average about one-half. Out of the number, too, nearly two-thirds had had their motions retrograde, or moved in the opposite way to the planets. While Halley was engaged on these comparisons and deductions, the comet of 1682 made its appearance, and he set about observing it with great care, in order to determine the elements of its orbit. Having done so, he found that there was a wonderful resemblance between it and three other comets that he found recorded—the comets of 1456, of 1531, and of 1607. The times of the appearance of these comets had been at very nearly regular intervals —at least, the differences had been only fractional parts of a year—the average period being between seventy-five and seventy-six years. Their distances from the sun, when in *perihelion*, or when nearest to that luminary, had been nearly the same, being nearly six-tenths of that of the earth, and not varying more than one-sixtieth from each other. The inclination of their orbits to that of the earth had also been nearly the same, between 17° and 18°; and their motions had all been retrograde. Putting them together, Dr. Halley concluded that the comets of 1456, 1531, 1607, and 1682 were re-appearances of one and the same comet, which revolved in an elliptic orbit round the sun, performing its circuit in a period varying from a little more than seventy-six years to a little less than seventy-five; or having, as far as the observations had been carried, a variation of about fifteen months in the absolute duration of its year, measured according to that of the earth. For this variation in the time of its revolution Dr. Halley accounted upon the supposition that the form of its orbit had been altered by the attraction of the remote planets Jupiter and Saturn, as it passed near to them; and thence he concluded that the period of its next appearance would be lengthened, but that it would certainly reappear in 1758 or early in 1759. Its doing so was, of course, the fact that was to be decisive of the orbits of comets, and that they were regular and permanent bodies, obeying the general laws of matter. Halley did not live to see the verification of his prediction; he died in 1742, aged eighty-four.

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do not know. As far as observation has gone, they are subject to the same laws as the planets, revolving in regular orbits or paths, with this difference, that their orbits are much more eccentric, or differ much more from circles, than the orbits of the planets; and thus, while they approach much nearer our system at one time of their revolutions, they recede correspondingly farther from it at another. The time since men had rational opinions on the subject has, however, been too short for verifying by observation the theory as applicable to the whole, or even the greater number of these bodies that have, from time to time, made their appearance.

Tycho Brahe was the first who expressed a decidedly rational opinion on the subject of comets. Finding, by careful observation, that the comet of 1577 had no diurnal parallax which he could detect—that is, that its place, when viewed from the surface of the earth, was not different from what it would have been if viewed from the centre; he properly concluded that its distance from the earth must be greater than that of the moon, in which this parallax was apparent to him. This was one step; and it was an important one: it removed comets to such a distance from the earth, that their use could not well be supposed to be for it, or their influence upon it very great. The general law of the motion of bodies in free space, as well as his own particular observations on the comet of 1680, led Newton to conclude that the orbits of the comets must, like those of the planets, be ellipses, having the sun in one focus, but far more eccentric; and having their *aphelions*, or greatest distances from the sun, far remote in the regions of space. The idea thus thrown out by Newton was taken up by Dr. Halley, who collated the observations which had been made of all the twenty-four comets of which notice had been taken previous to 1680. The results were abundantly curious; with but few exceptions, they had passed within less than the earth's shortest distance from the sun; some of them within less than one-third of it; and the average about one-half. Out of the number, too, nearly two-thirds had had their motions retrograde, or moved in the opposite way to the planets. While Halley was engaged on these comparisons and deductions, the comet of 1682 made its appearance, and he set about observing it with great care, in order to determine the elements of its orbit. Having done so, he found that there was a wonderful resemblance between it and three other comets that he found recorded—the comets of 1456, of 1531, and of 1607. The times of the appearance of these comets had been at very nearly regular intervals —at least, the differences had been only fractional parts of a year—the average period being between seventy-five and seventy-six years. Their distances from the sun, when in *perihelion*, or when nearest to that luminary, had been nearly the same, being nearly six-tenths of that of the earth, and not varying more than one-sixtieth from each other. The inclination of their orbits to that of the earth had also been nearly the same, between 17° and 18°; and their motions had all been retrograde. Putting them together, Dr. Halley concluded that the comets of 1456, 1531, 1607, and 1682 were re-appearances of one and the same comet, which revolved in an elliptic orbit round the sun, performing its circuit in a period varying from a little more than seventy-six years to a little less than seventy-five; or having, as far as the observations had been carried, a variation of about fifteen months in the absolute duration of its year, measured according to that of the earth. For this variation in the time of its revolution Dr. Halley accounted upon the supposition that the form of its orbit had been altered by the attraction of the remote planets Jupiter and Saturn, as it passed near to them; and thence he concluded that the period of its next appearance would be lengthened, but that it would certainly reappear in 1758 or early in 1759. Its doing so was, of course, the fact that was to be decisive of the orbits of comets, and that they were regular and permanent bodies, obeying the general laws of matter. Halley did not live to see the verification of his prediction; he died in 1742, aged eighty-four.

Soon after his death, Clairaut, D'Alembert, and Euler, three of the most eminent mathematicians of Europe, set about the solution of what is called 'the problem of the three bodies;' that is to determine the paths described by three bodies, projected from three given points, in given directions and with given velocities, their gravitating forces being directly as their quantities of matter, and inversely as the squares of their distances. The object of this problem is to find the disturbing effects that the bodies composing the solar system have upon each other; and it applies to comets when within the limits of planetary action, as well as the planets themselves. After some errors, into which all the three had been led, and which gave a result that seemed to overturn the whole doctrine of gravitation, Clairaut succeeded in obtaining an approximate solution, which agreed with and confirmed that theory. Having done so, he applied it to the calculation of the disturbing influence of Jupiter and Saturn, which Halley had predicted would retard the comet of 1682, in its reappearance about 1758. The results of Clairaut's calculations were, that the comet would be retarded 100 days by the attraction of Saturn, and 518 by that of Jupiter, so that it would not come to the perihelion, or point of its orbit nearest the sun, till the 13th of April, 1759. Clairaut, however, fixed certain limits, within which his calculations might probably be erroneous. It was eventually found that the difference between calculation and observation was less than that which he assigned. Clairaut read his investigations to the Academy of Sciences in November, 1758; and in little more than a month afterwards the comet made its appearance; and it reached its perihelion on the 13th of March in the following year, being thirty days earlier than he had calculated. Subsequent calculations enabled him to reduce the error to nineteen days; and though the calculations of the disturbing forces were only approximations, enough had been done to prove the return, and determine the orbit of one comet, and give every reason for concluding that all comets, being bodies of the same class, are subject to the same general laws as the planets, and only vary from each other in the proportion and magnitude of their orbits. There was one further confirmation. Clairaut had calculated that the node of the comet's orbit, or the point in which it cut the plane of the orbit of the earth, would advance 2° 33′ in absolute space, or 1° 29′ more than the equinoctial points, the precession of which, in the time of the comet's revolution, was 1° 4′; and observation gave exactly the same result; so that the only difficulty that remained in the doctrine of comets was in the estimation of the disturbances to which they are exposed from the other bodies of the system, more especially in the parts of their orbits most remote from the sun, where their motions are comparatively slow. Along with the period of this comet and its perihelion distance, the magnitude and form of its path were known. Estimating the mean distance of the earth from the sun at 95,000,000 miles (the number which was at that time considered as the true one), the mean distance of the comet was calculated to be 1,705,250,000 miles; its greatest distance from the sun, 3,355,400,000; its least distance, 55,100,000; and the transverse or largest diameter of its orbit, 3,410,500,000. Therefore, though its aphelion dis-

tance be great, its mean distance is less than that of Uranus; and great as is the aphelion distance, it is but a very trifling fraction less than one five-thousandth part of that distance from the sun, nearer than which the very nearest of the fixed stars cannot be situated; and as, with few exceptions, their distance is negative and not positive—a distance within which they cannot be, and not one at which they actually are—the nearest of them necessarily far exceed that distance. The comet of 1759 is, therefore, a body belonging to the solar system, and quite without the attraction of any body which does not belong to that system; and as this is determined of one comet, analogy points it out as being the case with them all. The Nautical Almanac for 1835 gave three computations of the time of the latest reappearance of this comet; by Messrs. Pontécoulant, Damoiseau, and Lubbock; who predicted that it would come into view on the 4th or 7th Nov. 1835. It was first seen by M. Dumouchel at Rome, August 5, and from that time continued to be observed till the end of the year in Europe, and through a great part of spring 1836, in the southern hemisphere.

Besides the comet of 1759, of which there have been four authenticated returns, there are two others of which something like a return has been traced at long intervals. One of these passed its perihelion at about eight o'clock on the morning of the 6th of July, 1264, reckoning mean time at Greenwich; and again at a little past eight o'clock on the evening of the 21st of April, 1556. Thus its period is about 292 years, and it was again expected in 1848. The perihelion distance, however, of this comet, which was more than half that of the earth in 1264, had diminished an eighth part by 1556; and as this must have caused a great elongation of its orbit, and as, from the length of its period, it must go far into the regions of space, there is no knowing how both the time of its revolution, and the form and position of its orbit, may have been altered.

The other comet, in the element of whose orbit there is a similarity, from which its identity might be with probability inferred, appeared in 1532, and again in 1661, having thus a period of about 129 years. The return of that comet should therefore have been about 1790. In that year three comets made their appearance; but neither of them resembled the one of 1661. Two of them moved in the opposite direction; and the remaining one was more than twice the distance from the sun in its perihelion, and its orbit at nearly double the angle with that of the earth.

The comet denominated *Encke's comet*, which has engrossed the public mind generally, and the scientific world in particular, has justly claimed and received the careful attention of astronomers, since its appearance in 1818 engaged Professor Encke to consider the elements of its orbit. He was enabled to identify it with a comet described by Messrs. Mechain and Messier in 1789, in the constellation Aquarius; also with a comet discovered in 1795 by Miss Herschel in the constellation Cygnus; and with the comet in 1805. The investigation of this diligent professor enabled him, from his observations on its appearance in 1818, to foretell its reappearance in 1822, and to state the probability of its not being observable in our climate. This anticipation was realized by its discovery in New South Wales, in the observatory of the governor, Sir Thomas Brisbane, June 2, 1822; and the accurate observations of Mr. Runker, who discovered it, afforded Encke the means of reconsidering the true elements of its orbit, and with additional confidence computing its return for 1825. This occurred as was expected. The fresh data afforded by that return were carefully collated by the professor. It was observed again on October 30, 1828. This comet affords particular interest to the mind of the astronomer, though it does not offer a splendid object to his eye. Its orbit is an ellipse of comparatively small dimensions, wholly within the orbit of Jupiter: its period is 1260 days, or about three years and three-tenths—a much shorter period than has hitherto appeared to comprise the revolution of any other comet, with the exception of one seen in 1770, which did not satisfy, as far as observation has been able to show, the prediction of the period of five years and a half which was attributed to it. In the opinion of Encke and other astronomers, this comet has afforded an opportunity of proving that the heavens oppose a resisting medium to the motion of bodies. The subject has been discussed in the Transactions of the Astronomical Society of London, by the able mathematician Massotti; and that gentleman offers reasons for considering comets capable of affording a demonstration of a resisting medium in the heavens, though planets may give no indication of it.

Another comet, which encourages the anticipation of much astronomical gratification, is one which Biela discovered, Feb. 27, 1826, and which was afterwards seen by Gambart and others. It seems to possess claims to the attention of astronomers similar to that of Encke. It has been ascertained to revolve about the sun in about six years and three-fourths, and to be the same as the comet which appeared in 1772 and that which appeared in 1805.

Several other comets remain to be noticed, the elements of which have been calculated, and in regard to some have been confirmed by returns. The orbit of one was calculated by Newton from its appearance in 1680, and he estimated the periodic time to be 575 years. It may therefore be expected in 2255. The magnificent appearance presented by Donati's comet in the autumn of 1858 will still be fresh in the recollection of all.

The comet of 1770, to which allusion has been made, would lead us to conclude that we are still ignorant of many of the causes by which the form of the orbits of comets, and the times of their revolution and return, may be disturbed. That comet moved almost in the plane of the earth's orbit, having an inclination of only about a degree and a half; it had been observed with great care; and the result of the observations was, that it should return about every five years and a half. Instead of going out of the system, as may be presumed to be the case with those comets that have long periods and eccentric orbits, its greatest distance could not be much greater than that of Jupiter, while its mean distance from the sun was not much more than three times the perihelion distance of the earth. No comet at all answering to that one has, however, been again discovered; and therefore the conclusion is, that there are, within the system itself, causes which can completely alter the motions of these bodies; but what those causes are, other than the attraction of the planets, has not yet been ascertained.

One remarkable difference between the comets and the planets is in the angles which their orbits make with that of the earth. Leaving out the small planets that have recently been discovered, all the others are contained within a zone extending only 7° on each side of the earth's orbit; and, with the exception of Mercury (by far the smallest of the *old* planets), they are within half that space. But the orbits of the comets are at all possible angles; and the number increases with the angle, so that they approximate to an equal distribution in all directions round the sun as a centre. Taking all the orbits of which the inclinations have been ascertained, it has been found that of every hundred the inclinations are as follows:

—from 0° to 30°, 26; 30° to 50°, 27; 50° to 89°, 39; and 80° to 90°, 8. Thus we see by far the greater number of the comets have their paths out of the direction of those of the planets; and hence, though they be bodies of such consistency as that their collision with the planets would produce serious consequences, there is but little chance that such collision can take place. The comets that have been observed have made their passages through very different parts of the solar system: 24 have passed within the orbit of Mercury; 47 within that of Venus; 58 within that of the Earth; 73 within that of Mars; and the whole within that of Jupiter. Of a hundred or thereabouts, mentioned by Lalande, about one-half have moved from west to east, in the same direction as the planets, and the other half in the opposite direction. The direct and retrograde ones do not appear to follow each other according to any law that has been discovered. From 1299 to 1532 all that are mentioned were retrograde; and five that were observed from 1771 to 1780 were all direct.

Being quite ignorant both of the size of the comets and their quantities of matter, we can form no conclusion as to their effects, even upon the positions of the planets. Hitherto their influence, if anything, has been very small; for within the limits that must be allowed for error, even in the best tables that are calculated upon an approximation, the whole of the irregularities are explainable upon the hypothesis of planetary disturbance alone; and the system appears to have gone on just as if there had been no comets in it. That the comets are formed of matter of some sort or other we know from the dense and opaque appearance of their nucleus, as well as from the action of the planets upon them; but as their action upon the planets has not been great, or even perceptible, we are led to the conclusion that they are not bodies of the same density or magnitude as even the smallest and rarest of the planets. When a comet is viewed through a telescope of considerable power, there appears a dense nucleus in the centre of the luminous and apparently vaporous matter, of which the external parts are composed; and the opacity of this nucleus varies in different comets. On its first appearance, and again when it recedes, the luminous part of the comet is faint and does not extend far from the nucleus; but as it moves on towards the perihelion, the brightness increases, and the luminous matter lengthens into a train, which, in some cases, has extended across a fourth of the entire circumference of the heavens. But though the general fact of the increased brightness of comets, and length of their tails, with their approach to the sun, and the consequent inclination of their motion, has been established, the observations have not been uniform or minute enough for proving what proportion the increase of brightness bears to the increase of the velocity and the diminution of the distance from the sun. No doubt all the comets of which there are well authenticated accounts of great brightness and length of tail have passed near the sun in their perihelion. Thus the comet of 1769, which was not a fifth of the earth's perihelion distance from the sun, had a tail of 60° in length, as seen at Paris; while that of 1759, which was distant more than half the earth's perihelion distance, had a train of only 2° or 3°. The length of the tail varies, however, not only with the time at which it is observed, but with the place of observation—a difference probably depending on the difference of clearness and purity in the air. The tail of the comet of 1759 was 25° long, as measured at Montpellier, in the south of France, and considerably more than that as measured at the Isle of Bourbon, in the Indian Ocean. That of 1769 was 60° at Paris, 70° at Boulogne, 90° between Teneriffe and Cadiz, and 97° at Bourbon. When the superstitious fear of comets, as portending harm to the inhabitants of the earth, had vanished before the light of philosophy, that light was in some danger of giving rise to fear of another sort—fear of physical harm to the earth itself, by the collision of some comet that might cross its path. We have no evidence, however, that such a collision ever did happen, either with the earth or with any other planet; and we have not absolutely correct means of so calculating the place of a comet as to be able to say with certainty that, on a given day, during a given month, or even during a given year, it shall cross the orbit of a planet. The motion of the earth in its orbit is in round numbers more than 1,500,000 miles in a day; and as Clairaut with all his care did not come nearer the truth than nineteen days, though the collision of a comet and the earth should be calculated from any known data, the earth might in fact be at the time far enough from the comet. Indeed, though the fact of the return of at least two comets be established, Halley's and Encke's, and the return of every one, if not affected by physical causes that lie beyond the limits of our present knowledge, has been rendered exceedingly probable, yet we can observe them for so short a portion of their courses, and these seem so very apt to be altered, that we ought not to speak of them with anything like the certainty with which we speak of the planets. As far as we have been able to examine them, they appear to obey the same laws as the other distinct masses that make up the known system of the universe. Beyond this we know nothing of their nature; and as for their effects moral or physical, we need give ourselves no trouble about them, there being no record of the occurrence of any such effects. In Pl. XLIX. L. some of the more remarkable comets that have from time to time come within the range of human vision are represented.

Within the last few years great advances have been made in our knowledge of the nature of comets, advances which somewhat qualify portions of what has been said above, and confirm the hypothesis that comets consist of groups of meteoric stones. At particular times we see brilliant displays of falling meteors, and it has long been considered that these bodies form belts circulating round the sun, and that the reason why we see such large numbers at particular times is that the earth's orbit cuts through the belt, the earth during its passage receiving great numbers of the stones. In 1866 Schiaparelli calculated, from observations on the August meteors, as the star-shower that we see annually about August 9–10 is called, an orbit for the belt, and on examination he found that it *agrees precisely with the orbit of the great comet of* 1862.

But a still more splendid discovery followed soon after. Annually about November 14 another star-shower is seen. Professor Newton of Yale College, United States, examining old records, found that from the year A.D. 902 there have been observed exceptionally brilliant displays of the November meteors, occurring in periods of about thirty-three years. From this he concluded that there is a denser portion of the supposed meteoric belt above referred to, and that the displays of extraordinary brilliancy take place when it is through this part of the belt that the earth passes in her orbit. He calculated that this dense portion of the belt must occupy a tenth to a fifteenth part of the whole, and he predicted that on November 14, 1866, we should pass through a part greatly denser than the average. Those who witnessed the magnificent display that fulfilled his prediction will not readily forget it. Professor Newton gave a choice of five different periods of revolution of this meteoric stream round the sun, any one of which would satisfy his statistics; and he found that the line of

nodes, that is, the line in which the plane of the meteoric belt cuts the plane of the earth's orbit, has an advancing motion of about 52″·4 annually. Adams, taking up the problem, showed by applying a method invented by Gauss, that, taking one of the periods given by Newton, and only one, this motion of the nodal line was completely accounted for by the disturbance of the planets Uranus, Jupiter, and Saturn. No doubt remained that this one period, thirty-three and a quarter years, must be admitted as the period of revolution of the star stream in question. On examining the orbits of the various comets that have been observed, one of them was found to agree exactly with that determined for the meteoric stream. This was Tempel's comet (Comet I. 1866), a small telescopic comet that was detected only a few months before Adams finished his labours. The evidence for the meteoric hypothesis was thus absolutely complete. A verification of it was obtained in the case of Biela's comet, through which the earth passed in the autumn of 1872, when a splendid star-shower was seen, excelling in numbers, though not in brightness, the famous one of November, 1866.

A recent theory of Prof. Tait, which has considerable support from the spectroscopic observations that have been hitherto made, probably goes far to explain cometary phenomena, although there are still some points to be cleared up. The heads of comets shine, as the spectroscope shows, partly by their own light; while the light of the tail is chiefly, if not altogether, reflected sunlight. Probably in the densest part of the meteoric stream the collisions of the meteors among themselves give rise to heat enough to dissipate parts of them in vapour, and these ignited gaseous exhalations give out the light observed. When near enough to us the comet's head is visible. The tail is merely a portion of the less dense train illuminated by sunlight, and the visibility of it depends not only on nearness and the degree of illumination, but also on the arrangement, as a flock of birds in the distance suddenly becomes visible when in such a position as to present the edge of the cloud to the observer. Thus is explained one of the most puzzling of cometary phenomena, the way in which the tail of the comet appears to project out from the sun while the comet is passing its perihelion position, apparently, according to our old notions of comets, in direct violation of the laws of gravity.

COMFORTABLE, a very expressive word among the English, and people of English descent. It has also been introduced into the French and German languages. Every nation has not only certain words which cannot be rendered precisely by any terms in other languages, but also certain ideas growing out of its customs, wants, &c., which do not exist with other nations, and which are the real cause of this peculiar significance of particular words. Such a word is *comfortable*, which signifies more than a mere physical feeling of gratification. In fact, it has something of the same indefinable and untranslatable character with the word *home*—a word which expresses a vast deal of feeling, of a faithful and tender attachment. *A comfortable home* is an expression, of which it would be impossible to approach to a translation in some other languages, for instance, in Italian; as an Italian finds his enjoyment in the open air in his lovely climate, and has little regard for the pleasures of home. Many circumstances may have co-operated to produce, among the English, their love of comfort, and the means for insuring it which we find in their houses. In fact, the comforts of an English dwelling surpass everything of the kind among other nations.

COMINES, Philippe de. See Commines.

COMITAT, the name given to most of the districts into which Hungary and Transylvania are divided for administrative purposes. The institution is a very ancient one, and had originally a military purpose. They date as far back as the conquest of Pannonia by the Magyars (end of the ninth century A.D.), when the strongholds that were found in the conquered country, as well as those which were built by the conquerors, came into the possession of the chief captains along with the surrounding territory. Hence their Hungarian name *Var-megye*, that is, 'castle district.' Until March, 1848, the comitats had an independent constitution aristocratic in its nature, only the nobles being regarded as having any political rights, although all the nobility had equal privileges. After this period several changes were made in this institution, and it was more than once abolished and restored, until its position was defined by the law of 1870 relating to the municipal government of Hungary and Transylvania. By this law the comitats are declared to be independent *municipia*, having the right of self-government in all affairs relating to their own internal management. They are also the means by which the public administration is carried on. Each of the comitats is presided over by an *Obergespan* or count, who is appointed and may be deposed by the king on the advice of the minister of the interior. The Obergespan is the representative of the executive authority, and as such exerts a control over the municipal government of the comitat, and watches over the carrying out of public administration through the comitat. All the other municipal officials are subordinate to him. Hungary is divided into forty-nine, and Transylvania into eight comitats.

COMITIA, with the Romans, the assemblies of the people in which the public business was transacted, and measures taken in conformity with the will of the majority. They existed even under the kings. In the time of the republic they were convoked by the consuls; in their absence often by the dictator, the tribunes, and in extraordinary cases even by the *pontifex maximus*. There were three comitia among the Romans, which were called *comitia curiata*, *comitia centuriata*, and *comitia tributa*. The oldest of these was the *comitia curiata*, so called because in it the people voted by *curiæ* or wards. It consisted exclusively of the patricians, the original ruling class at Rome, and the class to which the name of *populus* was at first restricted. They were divided into three tribes, the Luceres, Ramnes, and Tities, each of which was divided into ten *curiæ*, so that there were thirty *curiæ* who voted in the *comitia curiata*. The *comitia centuriata* was a mixed assembly of the patricians and plebeians, in which the people voted by centuries, as these had been formed by Servius Tullius. On the institution of this comitia the principal privileges of the *comitia curiata* were transferred to it, and in course of time the functions of the latter became a mere formality, so that even before the time of Cicero these were not performed by the *curiæ* themselves, but by thirty lictors representing them. The rights of the *comitia centuriata* were thus very important, comprising the right of electing the higher magistrates, the right of passing or rejecting laws proposed to them, the right of deciding upon war on the ground of a *senatus consultum* or decree of the senate, and the highest judicial power. This comitia could be held only on certain days, and it must be summoned seventeen days before the day of meeting. On the day of the comitia itself the presiding magistrate, with an augur, went into a tent before the city in order to observe the auspices. If the augur declared them unexceptionable, the comitia was held; if not, it was postponed to another day. Before sunrise and after sunset no business was

transacted in the comitia. The presiding magistrate, on his curule chair, opened the assembly by a prayer, which he repeated after the words of the augur. In earlier times, first the equites, then the centuries of the first class, &c., were called upon to vote. In later times lots were cast for the order of voting. The opinion of the century which first voted was usually followed by all the rest. In the earliest times every century voted verbally; in later times by ballot. What was concluded in each century by the majority, was proclaimed by the herald as the vote of this century. The comitia was interrupted if any one in the assembly was attacked by a fit of epilepsy (which was called for this reason *morbus comitialis*), or if a tribune of the people pronounced his *veto*, and under some other circumstances. The other comitia, the *comitia tributa*, which was also an institution of Servius Tullius, was essentially plebeian in its nature, for if the patricians were not, as some think, entirely excluded from it, they were in so small a minority that their influence was scarcely felt. It was based upon the division which Servius Tullius made of the whole Roman territory into thirty local tribes, which were afterwards increased to thirty-five. Its power was at first very limited, being merely local, but it gradually increased, so that in the end it came to possess the right of exercising electoral, legislative, and judicial functions, though not so extensive as those of the *comitia centuriata*. It had the right of electing only the inferior magistrates; legislatively, it was merely entitled to pass resolutions proposed by the tribunes, which before becoming law had to be sanctioned by the senate; judicially, it had the right of trying only those who had committed offences against the majesty of the people, and the only punishment it could inflict was a fine. It might assemble either within or without the walls of the city, but not at a greater distance than 1000 paces, which was the limit of the power of the tribunes. The *comitia centuriata*, on the other hand, always met in the Campus Martius. Sometimes the *comitia centuriata* was mixed with the *comitia tributa*, but in what manner it is not known. The emperors retained these assemblies for the sake of appearance, but used them only as instruments for the accomplishment of their purposes.

COMITLAN, or COMITAN, a town, Mexican Confederation, state Chiapas, 35 miles S.E. of Ciudad-Real, on the Grijalva. It has a magnificent church, and is a place of considerable trade. Pop. 10,000.

COMMA. See PUNCTUATION.

COMMA, in music, the smallest enharmonic interval, being the difference between a major and a minor tone, and expressed by the ratio 80:81. It is a term used in theoretic music to show the exact proportions between concords.

COMMAGENE, in ancient times a district in the N. of Syria, bounded on the E. by the Euphrates, on the N. by Mount Amanus, and on the W. by Cilicia, for some time attached to the kingdom of the Seleucidæ, but afterwards for more than 100 years an independent state. It seems to have become independent about 100 B.C., and on the death of its fifth king, Antiochus III., in A.D. 17, it was made a Roman province. It was again for a time allowed by the Romans to hold a position of nominal independence, but was again reduced to a Roman province by Vespasian, A.D. 73.

COMMANDER-IN-CHIEF, the officer who holds the supreme command over all the land forces of the kingdom. Sometimes the title of this officer is not commander-in-chief, but field-marshal commanding-in-chief, and the difference between them is that the former is appointed by patent for life, while the latter is appointed by a letter of service, and holds office only during the pleasure of the sovereign.—In the navy, the senior officer in any port or station appointed to hold command over all other vessels within the limits assigned to him.

COMMANDERY, among several orders of knights, denotes a certain district, under the control of a member of the order, who received a part of the income thence arising, for his own use, and accounted for the rest. There are strict and regular commanderies, obtained by merit or in order, and others are of grace and favour bestowed by the grand master. There are also commanderies for the religious, in the orders of St. Bernard and St. Anthony.

COMMANDITE, a term used in France, primarily for 'a partnership or firm, in which one advances the funds, while another devotes his skill and assiduity;' but by extension, a co-partnery *en commandite* oftener means a company for manufacturing or trading, 'with limited liability.' In terms of French commercial law, those whom we would call the 'sleeping partners' in such associations are denominated *commendataires*. Their names do not appear in the nominal title of the firm; they may assist it with their counsel, but they cannot order or sign for its behoof, nor act overtly for it in any way; on the other hand, they are not bound to incur a final loss in case of its failure, beyond that of the entire sum they have advanced, should indeed such be needed to satisfy the claims of agents and creditors. For all details on the rights and obligations of *commendataires*, see the French *Code de Commerce*, articles 23–28.

COMMELIN, ISAAC, born 1598, in Amsterdam, was a historian, among whose works the history and description of Amsterdam is still much valued. He died in 1676 at Amsterdam.

COMMELIN, JEROME, of Douay, a learned printer in Heidelberg, who died in 1598, was distinguished by his excellent editions of Greek and Latin classics. His emblem is a figure of Truth, and on many editions the words *Ex Officina Sanct. Andreana.*

COMMELIN, JOHN and CASPER, uncle and nephew, learned botanists in Amsterdam. The former died in 1692, his nephew in 1731.

COMMENCEMENT, in Cambridge, signifies the day when masters of arts and doctors receive their degrees. In the colleges of the United States this term denotes the day when the students are made bachelors of arts, and when the degree of master of arts and the honorary degrees of doctors in the professions are also conferred.

COMMENDAM, the name given to the administrative or provisional management of a benefice during a vacancy. The person intrusted with the management is called *commendator*. The grant was sometimes converted into a regular fief, and was then said to be in *perpetuam commendam*. The practice gave rise to great abuses, and the popes not unfrequently, under the name of commendams, alienated the revenues both of parishes and bishoprics, and conferred them on their nephews and favourites. A *commendam* bestowed on any of the orders of knights took the name of *commandery* (which see).

COMMENSURABLE, among geometricians, an appellation given to such quantities or magnitudes as can be measured by one and the same common measure. *Commensurable numbers*, whether integers or fractions, are such as can be measured or divided by some other number without any remainder; such are twelve and eighteen, as being measured by six or three.

COMMERCE, in the usual sense of the term, signifies the exchange of articles of any kind for money or other articles. In a primitive state of society such exchange is carried on by barter: one family or tribe giving goods it can spare, and receiv-

ing from its neighbour in return goods it is in want of. It is obvious that this exchange of commodities must have begun very early in the world's history, and it is equally obvious that as soon as any light and portable medium of exchange would become universally accepted, such as was found in precious metals, trade by barter would rapidly decrease. The means of transporting goods too indicate the state of civilization a country has attained; the pack-horse or camel, the lumbering waggon, and the railway-train have successively had their first necessity and reactionary influence on commerce.—Among the first people of antiquity who prosecuted commerce to any considerable extent are the Arabians and Egyptians. These nations, however, carried on their traffic by land, having made little progress in navigation. This was reserved for the Phœnicians, who became the naval carriers of the then known world. They formed numerous colonies, and the site of one of them (Gades) was so well chosen that it is even yet a flourishing port (Cadiz), though founded 3000 years ago. Their vessels are known to have sailed from India and Eastern Africa, on the one side, to Western Africa and Northern Europe. The city of Tyre, then 'the royal exchange of the world,' had flourished for seven centuries before it was destroyed by Alexander the Great. The Greeks were early skilled in commerce; Athens, owing to her position, becoming the commercial capital of the country. The spread of the Greeks contributed greatly to lessen the range of Phœnician enterprise. The ancient Massilia (now Marseilles) was founded by a Greek colonist in the sixth century B.C. Miletus, Ephesus, but before all Corinth, were remarkable for the extent of their trade. Gradually, as Athens declined, Alexandria (founded by the Macedonian conqueror after his destruction of Tyre) and Carthage arose, but the latter soon eclipsed her commercial contemporary. Between Carthage and Rome a reciprocity treaty was made 509 B.C. Subsequently others followed, and it is evident from them that Carthage was far superior to her military rival in all the essentials of civilization. The Romans were not a trading people in a comprehensive sense, but the extension of their power was favourable in many respects to commerce. Piracy was suppressed, and trading-vessels could sail in safety along the entire coast of the Mediterranean. Towards the middle of the fifth century of our era Rome became unable to defend its frontiers against the attacks of the northern and eastern barbarians. The increase in the population of cities was checked, many places being repeatedly plundered, and others subjected to heavy contributions; there was no longer a central government, and the empire became divided into a number of separate states, the rulers of which had no just idea of the importance of commerce. Constantinople, before and after its occupation by the Turks, was for a period a great centre of trade. It was rapidly eclipsed, however, by the commercial republic-cities of Italy. The apprehension engendered by the approach of barbarians from the north and east, induced a number of traders and manufacturers, settled in the north of Italy, to fix their residence in the small islands near the mouths of the Po. There they were secure from the assaults of the invaders, who had no means of carrying on hostilities by sea. Such was the origin of Venice, the queen of the Adriatic, and for a long time the leading mercantile state in the middle ages. Her squadrons sailed regularly to the Black Sea, to Egypt, Syria, and to Northern Europe, touching at various ports along the routes. Their north or Flanders fleet, as it was called, reached the north by the way of Barbary, the western shores of Spain and France, finishing their outward voyage at Antwerp, Bruges, or London. Closely following Venice in the wake of prosperity came Amalfi, Florence, Pisa, and Genoa, in Southern Europe, while in the north the cities of the Hanseatic League were laying the foundation of that wealth and power which enabled them to resist the attacks of mighty nations. The association of the Hanse towns consisted at first of Lübeck, Hamburg, and Brunswick, but soon embraced Amsterdam, Dort, Cologne, on the one side, and Dantzig, Königsberg, and Riga, on the other. In its palmy days it extended from Bergen to Bordeaux, and from Rouen to Novgorod. At the time of the formation of this league (the middle of the thirteenth century) the various countries of Europe were very imperfectly governed; there were no regular ports, and very few roads, so that the means of redressing grievances or of intercommunication were very scanty. For a period of 300 years those cities continued in a state of union; then the league gradually dissolved, not by violence, but simply because the different governments in Europe had acquired the power of protecting their mercantile subjects. The discovery of America in 1492 had much influence on commercial enterprise. It caused the rapid decline of Venice, but it made Spain an important nation. By misgovernment that country lost its hold on Holland soon after she had conquered Portugal. The Dutch became for a short time the first maritime power in Europe, but England, first under the Tudors, then during the Commonwealth, maintained a close struggle for naval supremacy, and by the end of the seventeenth century she was successful in attaining this enviable position, which she has hitherto held. Nothing like her commerce has the world ever witnessed; yet although steadily increasing, and apparently in a healthy condition, it seems, however, doomed to be eclipsed by her young transatlantic rival the United States.

That commerce has been one of the prime agents in the civilization of the world, is a fact now so universally recognized, that it would be useless to enlarge upon it here. There is, however, an idea still current, though no longer dominant, that a nation benefits itself most by manufacturing almost every article it consumes, and rendering itself independent of foreign imports. But it can be plainly shown that restriction on importation from abroad does no more than substitute one sort of employment for another. Its usual effect is to alter the distribution of capital and increase the price of commodities. Any commodity which can be as cheaply produced at home as abroad will be rarely imported. In almost every instance the imported articles could not be produced at home without a considerably greater outlay of capital. Suppose £100,000 worth of a commodity has been imported, that importation was now prohibited, and that we could not produce it at a less figure than £120,000, a small section of the community might be benefited, but the nation at large would simply be burdened with a tax of £20,000. Besides, if a monopoly were granted in favour of one branch of home industry, to be logical and just, we would be compelled to confer like privileges on others. It is with nations as it is with individuals, their mutual dependence knits them together, and leads to the most rapid increase in wealth, intelligence, and in every kind of improvement. (For information on the commerce of the different countries see the articles under the national headings.)

COMMERCE, Chamber of, an assembly of merchants and traders, where matters relating to trade are treated of. The first institution of this kind was that of Marseilles in France (opened 1700), quickly followed by those of Lyons, Rouen, Toulouse, Montpellier, Bordeaux, and other important towns.

The members of these bodies have, since 1852, been elected by the principal members of the district, chosen for that purpose by the prefect. The first chamber of commerce opened in Britain was that of Glasgow (1783). Two years later that of Edinburgh was established. In England the Manchester chamber was instituted in 1820; that of Liverpool dates as recently as 1850. In this country the government exercises no control over the elections for membership. The functions these bodies assign to themselves are to lay before the legislature the views of their members in matters affecting commerce; to furnish statistics as to the staple trade of the locality; to attain by combination advantages which could not be reached by private enterprise, &c.

COMMERCIAL COURTS are tribunals distinct from the ordinary civil courts, and are established in various commercial towns, or within certain districts, to settle disputes with regard to rights and obligations between persons engaged in trade, with the assistance of experienced merchants, by a brief process, according to equitable principles. The general introduction of tribunals of this sort began in the middle ages. The first was probably that established at Pisa in the eleventh century, and the basis of its decisions was the code of maritime laws with Pisa, confirmed by Pope Gregory VII. in 1075, from which the *Consolato del Mare* (see next article) may have been in part borrowed. At first the commercial tribunals were not so much courts established by government as arbiters of disputes, freely chosen by the merchants and confirmed by the governments. Under the name of *commercial consuls* such committees of arbitration were appointed in all the great commercial cities of Europe; and in the course of time they really became tribunals of justice, and were, in part at least, administered by men of legal learning and experience. Pope Paul III. confirmed the commercial consuls in Rome. Francis II. in 1560 granted to the Parisian merchants particular arbiters for the adjustment of commercial disputes; and in 1563 was established the Parisian Court of Commerce, consisting of a judge and four consuls. The same thing soon followed in all the important commercial towns of France. In London Henry VII. appointed particular commercial judges. The president of the commercial tribunal for the Hanse towns, established in 1447, bore the name of *alderman*. At Nürnberg, in 1621, a similar tribunal was instituted under the name of *inspectors of the markets*. The diets of the empire even called upon the German princes and commercial cities to follow this example, as the decrees of the empire of 1654 and 1668, and the decree of the imperial commission of October 10, 1663, show. In many of these cities, as in Frankfort-on-the-Main and in Leipzig, they were not so much independent authorities as delegates from the city councils. When commercial courts take cognizance particularly or solely of disputes relating to maritime affairs, they are called *courts of admiralty*. Such a court was erected in Hamburg in 1623. The internal regulations of commercial courts commonly require that a part of the members, or at least the presidents, should be lawyers; the rest are for the most part experienced merchants, who are better adapted than regular judges to give counsel on commercial affairs, with which they are more acquainted, and which very often are not to be reduced to simple principles of law, but are to be decided according to commercial practice. Their jurisdiction commonly extends over all commercial disputes, matters of exchange, insurance, freight, bottomry, average, &c.; and further, over bankrupts, the hiring of shops and stores, clerks, and apprentices; the debts of those who receive goods from merchants upon credit; and all natives and foreigners who traffic in the place, and are found there; all shipowners, contractors for transporting goods, brokers, factors, &c., are obliged to submit to their decisions. They do as much as possible by oral investigation; and the intention of their institution is that they shall avoid the long and formal process of other courts. But when the difficulty and confusion of the matters in dispute occasion the necessity of an investigation in writing, recourse is had thereto. The greater despatch of these courts consists prinpally in this—that the defendant is orally summoned, once or several times, to appear before them at an early day, and if he twice fails to come, is brought by force. The complaint is then made orally, both parties are heard, and sentence is given, if possible, immediately after. But as this can seldom be done, and most cases require reference to written documents, a day not far distant is appointed for the answer to the complaint and for the evidence on both sides, and the time is seldom or never prolonged. The remedies against a sentence must be sought from the same judges, and are not easily obtained. Appeals are only allowed in very important cases, and upon the deposit of a large sum as a pledge that the final decision shall be obeyed without delay. The principal features of this process are found in the Consolato del Mare (see chapters viii.–xxxi.), and form the basis of most commercial codes. According to the French code, each tribunal consists of a president, several judges (not more than eight, and not less than two in number), together with several persons who, in case of a pressure of business, become assistant-judges (vice-judges—*suppléans*), a clerk of the court (*greffier*), and several inferior officers (*huissiers*). The members of a commercial tribunal are chosen from among the most respectable merchants. Every merchant thirty years of age, who has done business in an honourable manner for five years, can be appointed judge or assistant-judge. The president must be forty years old, and have already exercised the office of judge. The election is made by ballot. The members elect take an oath before entering upon their office, which they hold for two years; they receive no salary, and cannot be re-elected until a year after the expiration of their term. The rules of the commercial tribunal are to be found under the twenty-fifth title of the second book of the Civil Code, and are very similar to those of the Consolato del Mare. From the sentence of these tribunals appeal is made to the court of appeal within whose jurisdiction they happen to be. The other countries where these tribunals exist are Belgium, Spain, Portugal, and Italy. In England and the United States there are no institutions of this nature. See COMMERCIAL LAW.

COMMERCIAL LAW (or the *law merchant*) is that which relates to trade, navigation, maritime contracts, such as those of insurance, bottomry, bills of lading, charter-parties, seamen's wages, general average, and also to bills of exchange, bills of credit, factors, and agents. Lord Mansfield describes it as a branch of the public law, and applied to its universal adoption the language of Cicero respecting the great principles of morals and eternal justice—'Nec crit alia lex Romæ, alia Athenis.' The body of rules constituting this law is substantially the same in the United States and Europe, the rules, treatises, and decisions of one country and one age being in general applicable to the questions arising in any other. The reason is obvious why this law should be common to different nations, for it regulates those contracts and transactions in which they come in contact, being a sort of neutral ground between their hostile interests, institutions, customs, and prejudices. National law, which regulates the conduct of different

nations towards each other, is distinguished from maritime law, by which private contracts between individuals are regulated. The first collection of marine laws was that of Rhodes, of which some fragments have come down to us in the Digest of Justinian, in the title De Lege Rhodia de Jactu; the collection under the title of Rhodian Laws, published at Basel in 1561, and at Frankfort in 1596, being generally considered as spurious. This title and that De Nautico Fænore recognize the first broad principles on the subjects of jettison and maritime law. The law *de exercitoria actione*, in the Digest, also transmits to us their principles as to the liability of the owners for the acts and contracts of the master of a vessel. The remaining rules and principles by which the commercial transactions of the ancients in the Mediterranean were governed have for the most part passed into oblivion. The reason of so small a space being assigned to this branch of jurisprudence in the Roman laws may be the low estimation in which trade was held by the Romans, who prohibited men of birth and rank from engaging in commerce, of which the code (4. 63. 3) speaks contemptuously; and Cicero says it was not fitting that the same people should be both the porters and the masters of the world. The Greeks adopted the Rhodian laws with modifications. The Athenian law on the subject of maritime loans is stated particularly in Boeckh's Economy of Athens (b. i. sec. 23), from which it appears that the rules on this subject were very definitely settled. The laws of trade naturally followed the trade which they were designed to regulate. Accordingly we find them first revived in the middle ages, on the shores of the same sea, in one of the islands of which they had their origin; a collection of them being made at Amalfi, a city within the limits of the present Kingdom of Naples, about the time of the first crusade, towards the close of the eleventh century, called the Amalfitan Table, the authority of which was acknowledged throughout Italy.

The origin of the compilation of sea laws which passes under the title of *Consolato del Mare*, though involved in some obscurity, is most generally assigned to the city of Barcelona in Spain. Some writers, however, and particularly Azuni, claim the honour of this collection also for Italy. But Casaregis, a profound commercial jurist, who published an edition of it in Italian at Venice in 1737; and M. Boucher, who published a French translation in 1808, from what he considers the original edition of Barcêlona of 1494, both admit the Spanish claim. These laws are supposed by M. Boucher to have been adopted and in use as early as the ninth century, and their authority was acknowledged in all the maritime countries of Europe, and some of the articles of this collection form a part of the present commercial law of all civilized nations. It has been translated into German also, but no entire English translation has yet been made. It is an ill-arranged, confused compilation; and though it is interesting as an historical record of the marine laws and customs of the middle ages, a large proportion of its provisions do not apply to the modes of transacting business and making contracts in modern times. The *Jugemens d'Oléron* (Laws of Oleron) are supposed to have been compiled about the time of Richard I.; and the honour of this collection, like that of the *Consolato*, from which it is partly borrowed, is in dispute, being claimed for the French by Valin, Emerigon, and Cleirac, who say it was made by order of Queen Eleanor, duchess of Guienne, for the use of that province, and adopted by her son Richard I., duke of Guienne. But Selden, Coke, and Blackstone assert that it is an English work, published by Richard I., in his character of king of England. The maritime codes of Wisby and the Hanse Towns are also of historical celebrity, and constitute a part of the legal antiquities of this branch of jurisprudence. These were the principal marine codes down to 1673, the date of the French ordinance of commerce, which treated largely of bills of exchange, and negotiable paper. In 1681 was published also the French Ordinance of Marine, one of the most glorious monuments of the reign of Louis XIV. It was framed under the influence of Colbert, and merits all its celebrity, being comprehensive, and including provisions, not only on many of the subjects of commercial law, as we have defined its limits, but also ample regulations on the subject of prizes. These ordinances are the foundation of the present system of marine law in Europe and America. Valin's commentary upon the Ordinance of the Marine, published in 1760, is a profound, original, comprehensive, learned, and accurate work. In 1763 he also published his commentaries on the provisions of the ordinance in relation to prizes. About twenty years afterwards (1782) Emerigon published his masterly treatise on insurance. The two ordinances, with the commentary of Valin and the treatise of Emerigon, made the commercial law a science, of which the principles were now settled, and their application also traced out into a great number of examples. It was now in the power of jurists, judges, and legislators to make every new question and case that should arise only a confirmation and extension, in application of doctrines which had been established upon conclusive reasons, and made parts of a harmonious system; and all the commercial nations have adopted the system thus formed. It forms the basis of the French code of commerce, and appears everywhere in the British, American, and continental treatises and decisions. The other French writers of greatest celebrity on this branch of law are Pothier, Cleirac, and Boucher. M. Jacobsen, a jurisconsult of Altona, has published a useful work on the subject of sea laws. The earlier English writers on commercial law were Malynes (a merchant), Molloy (a lawyer), Beawes (a merchant), Postlethwaite, Magens (a *dispacheur*, or adjuster of marine losses, originally of Hamburg, afterwards of London), and Wiskett (a merchant). But the marine law cannot be considered as having become a branch of the general science of jurisprudence in Britain until the time of Lord Mansfield, who appears to have had some considerable acquaintance with the treatise of Valin, from which he drew principles and reasons, and incorporated them into the reluctant common law. By degrees during his judicial career this branch of jurisprudence gained popularity, and from that time has occupied an important part of the British legal administration, though very few legislative enactments have either disturbed or promoted its progress. Though the maritime law in this country continued in a very rude and undigested state long after it was arranged into an admirable system in France, yet the assiduity with which it has been cultivated since its introduction, and the splendid talents which have been brought to its illustration, have contributed to advance it with a rapid progress. Among the ornaments of this branch of law we ought particularly to mention Lord Stowell, judge of the British High Court of Admiralty. Lord Tenterden, chief-justice of the Court of King's Bench, by his learned and well-arranged treatise on merchant shipping, contributed very materially to the present advanced state of British commercial jurisprudence. The other principal writers on this law are Millar, Park, Marshall, Bayley, Chitty, Lawes, Holt, and Benecke. Nor have the Americans been idle spectators of this improvement in a branch of law in which their industry and prosperity are so

deeply interested. Though they have supplied but few original systematic treatises and digests, yet in the numerous, important, and interesting questions that have been brought under discussion before the legal tribunals, the research, comprehensive views, and logical power displayed both by the counsel and the courts, will support a comparison with those of their European contemporaries, who might derive very useful additions to their own adjudications, particularly on the subjects of merchants' shipping and insurance, from the American reports. Among the most eminent of those who have contributed to the elucidation of the commercial law are Chief-justice Marshall, and Justices Washington and Story of the Supreme Court of the United States, and Chancellor Kent of New York.

COMMERCY, a town, France, department Meuse, on the left bank of the Meuse, 21 miles E. of Bar-le-Duc. In its ancient castle the Cardinal of Retz, who inherited it from his father Philippe Emanuel de Gondy, wrote his memoirs. A more modern castle, built in 1708, and afterwards the magnificent residence of Stanislas, is now a cavalry barrack. The town is tolerably well built, and has important iron-works in its vicinity. During the Franco-German war it was occupied by the Germans (14th August, 1870), and their second army here established its head-quarters (3d November). Pop. 4500.

COMMERSON, PHILIBERT, a botanist, born 1727 at Chatillon-les-Dombes, was a doctor of medicine in Montpellier. At the request of Linnæus he composed for the Queen of Sweden his celebrated treatise on the Fishes of the Mediterranean, the most important ichthyological work that had as yet appeared. In 1767, at the command of the King of France, he accompanied Bougainville on his voyage round the world. From the name of a young French lady, Hortense Barré, who accompanied him in a man's dress, he called a flower, now well known, *Hortensia*. During this voyage he died on the Isle de France, in 1773. He wrote, among other things, a botanical martyrology—a biography of those who have fallen victims to their efforts in the cause of botany. He left his plants, drawings, and papers to the royal cabinet at Paris.

COMMINES, or COMINES, two towns on opposite sides of the Lys, 8 miles N. of Lille. The one on the right bank is in France, and communicates by a drawbridge with the other, which is in Belgium. Anciently they formed a single town, which was fortified and had a castle, in which the celebrated historian, Philip de Commines, was born. The manufactures are chiefly ribbons and cotton goods. Pop. of French Commines, 6246; of Belgian Commines, 4000.

COMMINES, PHILIPPE DE LA CLYTE, SIRE DE, SEIGNEUR D'ARGENTON, a celebrated historian of his own times, was born 1445, at the castle of Commines, near Menin, in Flanders, and passed his youth at the court of the Dukes of Burgundy, Philip the Good, and Charles the Bold. He enjoyed the confidence of the latter, and contributed essentially to his reconciliation with Louis XI. He conducted other negotiations with equal sagacity, and in 1472 entered the service of Louis XI. probably on account of the rash and violent character of Charles, and induced by the promises of Louis, who loaded him with marks of favour. After the death of Charles the Bold Louis took possession of the duchy of Burgundy, sent Commines there, and soon after appointed him ambassador to Florence, where, during his year's residence, the conspiracy of the Pazzi broke out and failed. Commines displayed on this occasion the greatest activity in the cause of the Medici. He was then sent by Louis to Savoy, for the purpose of seizing the young Duke Philibert, and of placing him entirely under the guardianship of the king, his uncle. In 1483 Louis XI. died. During the regency of Anne of Beaujeau he was a member of the council, but having favoured the ambitious designs of the Dukes of Bourbon and Orleans, he was expelled from the court and confined for eight months in an iron cage in the castle of Loches. He was afterwards tried before the parliament in 1488, and pronounced guilty of having an understanding with several rebels, and of other crimes. By the sentence passed upon him, which seems not to have been executed, he was exiled for ten years to one of his estates, and the fourth part of his fortune was confiscated. Charles VIII. employed him in several negotiations in Italy, and he was one of the negotiators of the Treaty of Senlis in 1493. But this monarch was too wavering and imprudent; the advice of Commines was little regarded, and he received no reward but reproaches and dissatisfaction. Under Louis XII. he seems not to have taken an active part in affairs. He died at Argenton, October 17, 1509. His Memoirs are valuable contributions to the history of the time. The first edition was published at Paris between 1523 and 1528. The most complete editions are those of Lenglet Dufresnoy (London, 1747), and of Mlle. Dupont (Paris, 1847). He relates in them the events which occurred during his life, and in most of which he had an active share, in lively natural language, and displays everywhere a correct judgment, acute observation, and a profound knowledge of men and things. His memory is revived in the romance of Quentin Durward.

COMMISSARIAT, that department of an army whose duty it is to provide provisions, forage, camp equipage, &c., for the troops. Every army on active service has its own commissariat, under a commissary-general. Since the year 1859 considerable reforms have taken place in this department of the British army. It has now become a war office department, under a commissary general-in-chief. The full pay of the various grades of officers ranges from 7*s.* 6*d.* up to £3 a day. That of the subordinates is a slight degree in advance of ordinary soldier's pay.

COMMISSION, in law, is a writ which issues from a court for various purposes, such as the taking of evidence from witnesses confined by sickness or in foreign parts; also the warrant from the crown authorizing certain persons to transact some public business. In commerce the order by which one person traffics or negotiates for another; also the percentage allowed to the agent by the principal. In the army the warrant authorizing an officer to exercise command in the army is called his commission. Previous to 1st Nov. 1871, these commissions could be obtained by purchase, an ensign's costing from £450 in line regiments to £1200 in the Foot Guards, a lieutenant-colonel's ranging from £4500 in the line to £9000 in the Foot Guards. Commissions for the higher grades were not purchasable. At that date, however, a royal warrant, issued 20th July, 1871, by advice of her majesty's ministers, abolished the purchase of military commissions.

COMMISSIONAIRE, the attendant attached to continental hotels, who waits the arrival of the trains to secure customers, to look after their luggage, getting it passed through the custom-house, and sending it on to the hotel. They may also be employed as guides through the towns, and to act generally as valets-de-place. In London and Edinburgh bodies of commissioners have been established, drawn from the ranks of military pensioners of undoubted character.

COMMISSIONERS IN BANKRUPTCY. By Scotch law it is enacted that three commissioners

shall be elected by the creditors or their mandatories from their own number for the purpose of superintending and advising the trustee on the estate. Unlike the trustee they are not required to find security, nor do they receive remuneration; but equally with the trustee they are prohibited from purchasing any portion of the estate.

COMMITTEE. Large deliberative assemblies, with a great variety of business before them, are unable to discuss and investigate sufficiently many subjects on which they are obliged to act. Committees, therefore, are appointed to examine and report to the assembly. Committees have a right to choose their chairman. In the British Parliament and the legislative bodies in the United States, as, in fact, in all legislative bodies in representative governments, there are select and standing committees. The French chambers were divided into *bureaux*. The standing committees are appointed in Britain and the United States by the speaker or president of the house at the beginning of each session. In the British Parliament the standing committees appointed at every session are those of privileges and elections, of religion, of grievances, of courts of justice, and of trade, though only the first mentioned acts. In the Congress of the United States the standing committees are very numerous; some of the most important are those of elections, of ways and means, of commerce, of public lands, of the judiciary, of public expenditures, of Indian affairs, of foreign affairs, of manufactures, &c. In fact, business is done by means of committees much more in the American Congress than in the British Parliament. The committees thus appointed are sometimes permitted to resolve themselves into committees of secrecy.

Committee of the Whole.—Matters of great concernment are usually referred to a committee of the whole house, where general principles are digested in the form of resolutions, which are debated and amended till they take a shape which meets the approbation of the majority. These being reported and confirmed by the house are then referred to one or more *select committees*, according as the subject divides itself into one or more bills. The sense of the whole assembly is better taken in committee, because in all committees every one speaks as often as he pleases. They generally acquiesce in the chairman named by the speaker, but, like all other committees, have a right to elect their chairman, some member, by consent, putting the question. When the house is desirous of forming itself into a committee, the speaker, on motion, puts the question whether the house will resolve itself into a committee of the whole, to take into consideration such a matter, naming it. No previous question can be put in a committee; nor can this committee adjourn, as others may; but if their business is unfinished when the time of separation arrives, a motion is made for rising, and the chairman reports that the committee of the whole have, according to order, had under their consideration such a matter, and have made progress therein, but not having had time to go through the same, have directed him to ask leave to sit again. The question is then put whether the request shall be granted, and if so, at what time the house will again resolve itself into a committee. But if they have gone through the matter referred to them, the chairman reports, either immediately, or, if the house wish, at a later period.

COMMITTEE OF PUBLIC SAFETY (*Comité du Salut Public*), a body elected by the French Convention (6th April, 1793) from among its own members, at first having very limited powers conferred upon it—that of supervising the executive and of accelerating its actions. Subsequently, however, its powers became extended; all the executive authority passed into their hands, and the ministers became merely their scribes. It was at first composed of nine, but was increased to twelve members viz.:—Robespierre, Danton, Couthon, St.-Just, Prieur, Robert-Lindet, Hérault de Séchelles, Jean-Bon St.-André, Barrère, Carnot, Collot d'Herbois, and Billaud Varennes. In the terms of its constitution the members should have been elected only for one month, but all the above-mentioned held their seats for a whole year. The prevailing party acted on the ground that France, threatened from within and without, could not be governed as if at peace, but could only be saved by desperate measures, as in times of the greatest danger. But after the downfall of the Girondists, June 1 and 2, 1793, when the Mountain, on the recommendation of the committee of safety, declared that the population of France consisted of but two parties—patriots and enemies of the revolution—and consigned the latter to the persecution of all good citizens, terror took the place of law. From this time the committee governed the Mountain party, and through it the convention. As the sole rule of his conduct Robespierre declared that the main-spring of a popular government in a state of revolution was *la vertu et la terreur!* Carnot confined himself to the direction of the armies, and left to his colleagues the affairs of the interior. At the motion of these men the new constitution was suspended for a time, and the revolutionary government conferred on the committee of safety by a decree of the convention of Dec. 4, 1793. The committee now instituted in all the communes of the republic, as judges of the suspected, revolutionary committees, composed of the most furious zealots: the number of these new tribunals was as great as 20,000. The last remaining forms of regular process were abolished; their place was supplied by violence, and often by avarice and folly. In this time of internal revolutions, and danger from without, it was not in the power of man to restrain the exasperated fury which, probably, alone prevented France from being conquered. Finally Danton, who had absented himself for a time from the committee on account of the influence of Robespierre, declared himself against the system of bloodshed; and Robespierre himself acquiesced in the condemnation of the ringleaders of the Paris mob (March 24, 1794), among whom was Hébert; but soon after (April 5) Danton, with Hérault de Séchelles, was himself overthrown by Robespierre. Till July 28, 1794, the latter now remained master of the lives of 30,000,000 of men. He appointed Fouquier-Tinville public accuser. Prisons were multiplied and crowded; the prisoners were cruelly treated, betrayed by spies, and condemned without being allowed the privilege of defence; the property of all imprisoned on suspicion was confiscated, and the guillotine remained *en permanence*. The same violence was practised in the provinces by some of the delegates of the committee of safety, especially Collot d'Herbois and Carrier. Among the numberless victims of the system were the noble Malesherbes and the celebrated Lavoisier. The members of the committee of public safety and of the *comité de sureté générale* at last disagreed among themselves. Each committee contained three parties. These, and not Tallien, were the real causes of the 9th Thermidor. In the committee of public safety Robespierre, Couthon, and St.-Just (*gens de la haute main*) formed one party; Barrère, Billaud, and Collot d'Herbois (*les gens revolutionnaires*) another; and Carnot, Prieur, and Lindet (*les gens d'examen*) a third. In the *comité de sureté générale* one party comprised Vadier, Amor, Jagot, Louis (*du bas Rhin*), and Voulland (the *gens d'expé-*

dition); to a second belonged Danton and Lebas (*écouteurs*); to the third Moise Bayle, Lavicomterie, Elie Lacoste, Dubarran (*les gens de contrepoids*). Robespierre attempted to remove the unyielding Carnot from the committee of safety. On the other hand Billaud Varennes laboured to effect Robespierre's downfal. Couthon, St.-Just, the Jacobins, and the *commune* of Paris alone adhered to Robespierre. But when St.-Just actually proposed in the committee a dictatorship for the safety of the state an opposition was raised against Robespierre in the national convention by Vadier, Collot d'Herbois, Billaud Varennes, and especially by Tallien and Fréron; the dictator and his faction were proscribed, and the victory of Barras (see BARRAS) on the 9th Thermidor (July 27), brought Robespierre, his brother, St.-Just, Couthon, &c., 105 in all, to the scaffold, July 28. The convention now recovered its authority; the Jacobins and the partisans of terrorism (*la queue de Robespierre*) were completely overthrown; at the same time the convention gave the committee of safety and the revolutionary tribunal a more limited power and jurisdiction. The bloody despotism ceased; and when a new constitution introduced (Oct. 28, 1794) a directorial government (see DIRECTORY), the convention was dissolved, and with it sank into its grave the revolutionary government, the reign of terror, and the committee of public safety.

COMMODORE (corrupted from the Spanish *commendador*), a general officer in the British marine, invested with the command of a detachment of ships of war destined for any particular enterprise. He retains this title only during the continuance of the expedition, during which he has the rank of a brigadier-general in the army, and his ship is distinguished from others in his squadron by a broad red or blue pendant. The eldest captain of three or more vessels cruising in company is often called *commodore* by courtesy. In the United States the title *commodore* is only given by courtesy, not officially.

COMMODORE SHIP, in a fleet of merchantmen, is the convoy and principal ship, which leads the other vessels, and keeps them together, bearing a light in her top.

COMMODUS, L. AELIUS AURELIUS, son of Marcus Aurelius and of Anna Faustina, daughter of Antoninus Pius, was born A.D. 161, and gave early proofs of his cruel and voluptuous character. When a boy of twelve years old he ordered the overseer of his bath to be thrown into the furnace because his bath was too hot. His father, who hoped to correct him by mildness and his own example, permitted him early to partake in the government, conferred on him the office of tribune, and, in his sixteenth year, the office of consul, and soon afterwards the titles of *Augustus* and *father of the country*. He married him to Crispina, daughter of Bruttius Præsens. On the death of Marcus Aurelius, A.D. 180, Commodus ascended the throne, and showed himself a more execrable monster than even Caligula, Domitian, or Nero. For his amusement he cut asunder persons whom he met, put out their eyes, mutilated their noses, ears, &c. He was endowed with extraordinary strength, and often appeared in imitation of Hercules, dressed in a lion's skin, and armed with a club. Three hundred concubines, and as many boys, even the lowest prostitutes of Rome, were not sufficient to satisfy his infamous lusts. He had even an incestuous intercourse with his sisters, and killed one of them (Lucilla), who had refused to submit to his wishes, and had concerted a conspiracy against him. To fill the treasury, exhausted by his extravagances, he imposed unusual taxes upon the people, sold governments and offices to the highest bidder, and pardoned criminals for money. To display his strength and skill in arms he appeared publicly on the amphitheatre. He is said to have fought in this way 735 times, and as his opponents were armed with weapons of tin or lead, while he was encased in impenetrable armour, he had naturally an easy victory on every occasion. In his combats with wild beasts he was securely protected by a screen of network, through which he hurled his darts or shot his arrows. Immediately after ascending the throne Commodus concluded an inglorious peace with the Quadi and with other German nations. In Britain his valiant general Ulpius Marcellus gained important victories over the Caledonians, on account of which Commodus took the titles of *imperator* and *Britannicus*. The administration of affairs had been at first left to his freedman Anteras, who was accused of having seduced the emperor, and was killed by the commanders of the body-guard. Commodus, after taking a bloody revenge for the death of his favourite, placed another freedman, Cleander, at the helm of state. A part of the city having been consumed by fire, and the people having been reduced to despair by famine, disturbances broke out, and the emperor was obliged to consent to the death of his minister, who was charged with being the author of these calamities. On the 1st of January, A.D. 193, he intended to appear at the same time as consul and gladiator, after having put to death the two consuls elect. He was so much enraged by the opposition of his friends to this design that he resolved on their death. The tablets upon which he had written their names were found by accident, and given to one of his concubines (Marcia), who, with surprise, found herself among the number. She conspired with the rest against the life of the emperor. They administered poison to him, and, as the poison operated too slowly, he was strangled by the hands of his favourite gladiator Narcissus (Dec. 31, 192). On the news of his death, which was reported to be the consequence of an apoplexy, the senate declared him an enemy of the state, ordered his statues to be broken to pieces, and his name to be erased from all public inscriptions. He perished at the age of thirty-one years and nine months, after a reign of twelve and a half years. Rome was indebted to him for her handsomest baths —the Thermæ Antoninianæ. He established also an African fleet, in addition to the Egyptian one, for the purpose of supplying the city with corn.

COMMON, RIGHTS OF.—There are various kinds of rights of common recognized by the common law of England, namely, of *pasture*, of *piscary* or fishing, of *estovers* or wood, and of *turbary* or of digging turf. But the phrase usually means the right of pasturing cattle, horses, &c., in a certain field, or within a certain territory. And this again is of different kinds: as common *in gross*, when the grantee is not in the occupation of lands, with which this right of pasturage is connected; and *appendant*, where a person, occupying a certain piece of arable land (or *appurtenant*, where he occupies such land or a house), has the right of pasturage in a certain other piece of land; and also a right of common *par cause de vicinage*, or by reason of vicinity,—the right which the tenants of a lord in one town had of pasturing their cattle with those of the tenants of another lord in another town. These rights, in England, have been mostly determined by prescription or immemorial usage; by which also was regulated, in most instances, the kind of animals which might be turned upon the land (which were usually horses, oxen, cows, and sheep, but not goats, hogs, or geese), and the number, and the time of the year when they might be turned in. In the United States of America there are not wanting instances of right of common, appurtenant and

in gross; but the regulation of this species of rights does not occupy a great space in the laws. In Scotland a common is considered as a common right of property in a piece of ground by a number of individuals, such as the inhabitants in villages; there is no superior, but the land is the land of the community generally. The act 1695, cap. xxxviii., makes all commons (or as they are often termed *commonties*), except those belonging to the crown and royal burghs, divisible at the instance of those having any interest, by an action in the Court of Session.

COMMON CARRIERS. See CARRIERS.

COMMON LAW. The phrase 'the common law' is a very familiar expression in English jurisprudence, and has various significations, or rather, is used sometimes in a limited and sometimes in a more enlarged sense. In a large sense it comprehends the whole body of English law, as well the statutes passed by Parliament as the general customary law of the realm. In this manner it is used in contradistinction to the Roman, or, as we call it, the *civil* law. In a more limited sense, 'the common law' expresses that portion of English jurisprudence which is unwritten (*lex non scripta*), in contradistinction to the parliamentary statutes, which are the positive written code (*lex scripta*). For instance, we say that a particular remedy for a wrong is given by the common law, and that another remedy, by way of penalty, is provided by statute; meaning that the latter depends upon some known act of the legislature; but the former rests altogether upon immemorial usage or general principles, which cannot be traced back to any such act. There is yet a still more limited sense in which the expression is used to designate that portion of the English common law which is strictly the custom of the realm, and local and municipal in its origin, in contradistinction to the law of nations, and the maritime and commercial law, which are drawn from the general usages and principles recognized among civilized nations. Correctly speaking, the common law now comprehends the law of nations and the law merchant. But these are of much later introduction into English jurisprudence than the other general customs of the realm of which we have been speaking. They have been borrowed, for the most part, from the general usages of merchants in the commercial nations, which, upon the revival of commerce and letters, inhabited the shores of the Mediterranean. For instance, the law of foreign bills of exchange, of insurance, and of general average, is of comparatively recent adoption in England, and cannot be traced back far in her annals. The law of insurance has almost entirely grown up since the time when Lord Mansfield became the chief-justice of England (1756). The name of the *common law*, which is thus given to this collection of maxims and customs in England, Blackstone (1 Bl. Comm. 67) says, was either given to it in contradistinction to other laws, as the statute law, the civil law, the law merchant, and the like; or, more probably, as a law common to the realm (*jus commune*, or *folk-right*), mentioned by King Edward the elder, after the abolition of the several provincial customs and particular laws by King Alfred and his successors. But though it is called the *lex non scripta* (or *unwritten law*), we are not to imagine that it is at present merely oral, and transmitted from age to age by word of mouth. In the dark ages, indeed, few laws were reduced to writing, and still fewer of these maxims and customs were to be found in books or manuscripts. But (as Blackstone has observed, 1 Bl. Comm. 63) with us at present the monuments and evidences of our legal customs are contained in the records of the several courts of justice, in books of reports and judicial decisions, and in the treatises of learned sages of the profession, preserved and handed down to us from times of the highest antiquity. They are, however, still styled the *unwritten law*, because they are not set down in a code, as acts of Parliament are, in writing, but they derive their authority from long and immemorial usage, and the universal recognition of them throughout the realm. The origin of this common law is now lost in remote antiquity. It probably began in the early customs of the aboriginal Britons, and was successively augmented, in different ages, by the admixture of some of the laws and usages of the Romans, the Picts, the Saxons, the Danes, and the Normans, who spread themselves over the country. It was feeble and narrow at first; but, expanding with the exigencies of society and with the progress of knowledge and refinement, it has now become a very complex and intricate system, and presents a singular combination of the strict principles of the old feudal law, with the elegant reasoning of public and commercial jurisprudence, which are so much admired for their general equity. Of such a gradual formation and expansion is, doubtless, the law of most civilized countries. The Roman or civil law is made up, not merely of the positive legislation of the senate and the people, and the edicts of the emperors, but also of the decrees of courts of justice, of the opinions of learned jurists, and of the silent but irresistible usages of the people in the arrangements of their business and domestic policy. These usages, at first voluntary and arbitrary, generally acquired the force of custom; and tradition made them operate as laws to regulate like concerns in other ages; and as they were generally founded in public convenience, they were adhered to, first from habit, and at last from an anxious desire, natural in all governments, to profit by the experience of the past, and to fix rights by some certain rules coinciding with the existing state of the people.

The common law is usually divided into three kinds:—1. General customs, which are the universal rule of the whole kingdom, and form the common law in its more usual signification. 2. Particular customs, which, for the most part, affect only the inhabitants of particular districts. 3. Certain particular laws which, by custom, are adopted and used by some particular courts of pretty general and extensive jurisdiction. (1 Bl. Comm. 67.) The first embraces the general maxims and principles of English jurisprudence, such as the regulation of the descent of estates, the exposition of contracts and wills, the remedies for civil injuries, and the definition and punishment of crimes, &c. The second embraces the jurisprudence of a peculiar nature existing in certain local districts, such as the custom of gavelkind, in Kent county, where all the sons inherit the estate of their parent, and not (as is the general law of England) the eldest son; so the custom of Borough English, where the youngest son inherits the estate; such also are the peculiar customs of the city of London. The third embraces those portions of the civil law and the canon law which are of force in the ecclesiastical and admiralty and other courts, and have long constituted the system which regulates the rights and remedies administered in those courts. This subject will be found discussed at large in 1 Bl. Comm. from p. 63 to p. 92, and in Lord Hale's History of the Common Law.

The common law of England constitutes the general basis of the jurisprudence of all the United States of America, except only Louisiana, where the civil law prevails. This common law consists only of the first and third kinds of customary law above mentioned, there being no local or provincial law existing in any particular county or district of any state, as contradistinguished from that which prevails in the

state at large. When we say that the common law constitutes the basis of American jurisprudence, we do not mean that the whole common law as it exists in England is adopted. The general doctrine is that such portions of the common law only as were adapted to the situation of the colonies at their first settlement, and were thereafter recognized and acted upon, are now of force in the States. But many portions were never in force at all in America. For instance, the ecclesiastical establishment, and much of the law growing out of it, was never introduced or recognized there. Americans consider that all the statutes made in England before the emigration of their ancestors, which were in amendment of the law, and in melioration of it, constitute a part of their common law, and as such were brought hither by their ancestors at their emigration. But statutes since enacted have no force at all there, unless they have been sanctioned by the legislature, or have been adopted into their local practice by general usage, as amendments of the law. And indeed many of the fundamental principles of the common law have been altered, repealed, or modified by positive legislation of the various states, as well while they were colonies as since their independence; so that, though the general basis is the same, there are almost infinite shades of difference in the actual jurisprudence of the different states.

There is another sense in which they speak of the common law, in contradistinction to what is called *equity jurisprudence*. The administration of a distinct system of jurisprudence by distinct tribunals of this nature seems peculiar to Britain and the colonies which derive their origin from her. Blackstone (3 Bl. Comm. 50) has well observed that the distinction between law and equity, as administered in different courts, is not at present known, nor seems ever to have been known in any other country at any other time; and yet the difference of one from the other, when administered by the same tribunal, was perfectly familiar to the Romans; the *jus prætorium*, or discretion of the prætor, being distinct from the *leges*, or standing laws. It would occupy too much space to enter into a full development of this distinction in the actual administration of justice in England. In general, courts of equity administer remedies *ex æquo et bono* only in cases where the courts of common law cannot administer an adequate remedy. Hence a very familiar expression is, that a right is an *equitable right*, or an *equity;* by which we mean that it is a right recognized only in courts of equity, and for which the common law, in its ordinary tribunals, affords no remedy, and of which it takes no notice.

COMMON PLEAS, Court of. See Courts.

COMMON PRAYER, Book of. See Liturgy.

COMMONS. The commons of Great Britain, in a general sense, consist of all such men in the kingdom as have not seats in the House of Lords, every one of whom has a voice in Parliament, either personally or by his representatives. Commons, in Parliament, are the lower house, consisting of knights elected by the counties, and of citizens and burgesses by the cities and borough towns. In these elections, anciently, all the people had votes; but in the 8th and 10th of King Henry VI., for avoiding tumults, laws were enacted that none should vote for knights but such as were freeholders, did reside in the county, and had 40*s*. yearly revenue, equivalent to nearly £20 a year of the present money; the persons elected for counties to be *milites notabiles*, at least esquires or gentlemen fit for knighthood; native Englishmen, at least naturalized, and twenty-one years of age; no judge, sheriff, or ecclesiastical person to sit in the house for county, city, or borough. The House of Commons, in Fortescue's time, who wrote during the reign of Henry VI., consisted of upwards of 300 members: in Sir Edward Coke's time their number amounted to 493. At the time of the union with Scotland, in 1707, there were 513 members for England and Wales, to which 45 representatives for Scotland were added; so that the whole number of members amounted to 558. In consequence of the union with Ireland, in 1801, 100 members were added for that country; and the whole House of Commons therefore consisted of 658 members. By the reform bill of 1832 the number of members was altered as follows: 500 for England and Wales, 53 for Scotland, and 105 for Ireland. The reform acts of 1867 and 1868 introduced a further alteration: the number of members now stands: 493 for England and Wales, 60 for Scotland, and 105 for Ireland. See the article Britain, subdivision Parliament.

COMMONS, Doctors'. See College of Civilians.

COMMON SCHOOLS. See Schools.

COMMON SENSE, The Philosophy of. See Philosophy (Mental).

COMMON TIME, in music, is that in which every bar contains an even number of subdivisions, such as two minims, four quavers, or their equivalents.

COMMUNE, in France, 1. A territorial division, governed by a mayor assisted by a municipal council. 2. An association of the inhabitants of the same town enjoying the privilege of self-government.

COMMUNE OF PARIS.—1. A revolutionary committee which took the place of the municipality of Paris in the French revolution of 1789, and soon usurped the supreme authority in the state. Among its chiefs were some of the most violent of the demagogues, such as Chaumette, Hébert, Danton, and Robespierre. It was at a secret meeting of its most influential members, in 1792, that the September massacres were decided on which formed the prelude to the Terror, when the Hébertists, the Dantonists, Robespierre and his accomplices followed each other to the scaffold. With the fall of the last (17th July, 1794) fell also the Commune. —2. The name adopted by the ultra-radical party brought once more into prominence by the events of the Franco-German war, more immediately by the siege of Paris (Oct. 1870 to Jan. 1871). Twice during the siege the leaders of this party had attempted to depose the government of national defence, which came into power 5th September, but each time they were unsuccessful. But the capitulation, although inevitable, brought discredit upon the actual rulers. Under such leaders as Blanqui, Assi, Cluseret, Delescluze and Flourens, a strong organization had been formed in the quarters of Belleville, La Villette, and Montmartre. While the Prussians remained in the city they had preserved a prudent stillness, throwing up here and there a barricade or two and waiting the course of events; but they had succeeded in getting possession of a great quantity of cannon and mitrailleuses, and removed them to positions of their own choosing, under pretext of saving them from falling into the hands of the national enemy. Their ranks were swelled by whole divisions of the National Guard, who by the peace were likely to be disbanded, and thus be compelled again to work for their subsistence, which they had now lost all taste for doing. On the 16th March the central committee of the Communists intimated to General Aurelle de Paladines, the commandant of Paris, that neither the artillery parked at Montmartre, nor the arms of the National Guard would be given up, until these citizen soldiers were invested with the right of in future naming their own officers. The government seemed at last to be prepared to act

with vigour. General Vinoy, who undertook the suppression of the revolt, advanced during the night of the 17th March against Montmartre, and after a short struggle succeeded in establishing himself there. But on the following morning he was driven out by the National Guards, the prisoners he had taken were set free, and a second attack was repulsed. Generals Thomas and Lecomte, who had advanced too far, were deserted by their own men, were captured by the insurgents, and without form of trial, shot. Other bodies of the National Guard seized upon the Hôtel de Ville, drove out the remaining government officials, and substituted the red flag for the tricolor. Vinoy withdrew across the Seine with the rest of his army, and took up his position at the Pont de Sèvres. While the insurrectionary troops were occupying one by one the forts surrounding the city (all of which, with the exception of those on the east and north-east, held by the Germans, and Mont Valérien, held by their opponents, they quickly gained possession of), the central committee established themselves in the Hôtel de Ville, setting about the organization of a government according to their principles. What these are we shall allow them to state themselves—'We demand the recognition and consolidation of the Republic as the only form of government compatible with the rights of the people and the development of society; the absolute independence of the Commune, and its extension to every locality in France. The independence of the Commune will have but one limit: the equal right of independence to be enjoyed by the other Communes who shall adhere to the contract. The inherent rights of the Commune are these: the right of voting the communal budget of receipts and expenditure, of regulating and reforming the system of taxation, and of directing local services; the right to organize its own magistracy, the internal police, and public education; to administer the property belonging to the Commune; the right of choosing by election or competition, with responsibility and a permanent right of control and revocation, the communal magistrates and officials of all sorts; the right of individual liberty under an absolute guarantee, liberty of conscience, and liberty of labour; the right of permanent intervention by the citizens in communal affairs by means of the free manifestation of their ideas, guarantees being given for such manifestations by the Commune, which is alone charged with the duty of guarding and securing the free and just right of meeting and of publicity; the right of organizing the urban defences and the National Guard, which is to elect its own chiefs, and alone provide for the maintenance of order in the cities.' Manifestoes were issued for the purpose of justifying their proceedings to the rest of the nation, and appeals made for sympathy and co-operation without much success, except in the case of Lyons, where Communalism was triumphant. The election of members of the Paris Commune was ordered for the 26th March, on which occasion only 200,000 votes were recorded, the wealthier and more orderly classes abstaining, which gave the Communalists an easy victory. The nominees of the central committee, Assi, Félix Pyat, Blanqui, Paschal Grousset, Rochefort, &c., were returned by overwhelming majorities. As soon as the new government was installed a long list of decrees appeared in the Journal Officiel. By one the conscription was abolished. It was decreed that no central force, except the National Guard, should be created or introduced into Paris. All able-bodied citizens were to form part of the National Guard. A general remission of rents was granted to lodgers from October, 1870, to April, 1871. All public officers were henceforth to consider the authority of the government which had established itself at Versailles as null and void, on penalty of dismissal. Meanwhile the National Assembly was concentrating its troops at Versailles, and preparing to put down the Commune by force of arms. At the close of March Paris was formally laid siege to. On the 2d April a collision took place between a division of the troops of the assembly and a body of the National Guard at Courboie, in which the latter were driven back into the city, leaving some prisoners in the hands of the Versaillists. Those prisoners were summarily executed, a deed which fairly roused the Parisians to madness. An immense sortie was organized to converge upon Versailles from the west and south-west of the enceinte of Paris. On the night of the 2d 100,000 National Guards turned out to the rappel. The right wing, under General Bergeret, commenced its march at half-past six in the morning, confidently believing that the governor of Mont Valérien would assist them, or at least keep his guns silent, and that the regulars would not fight. In this they were miserably mistaken; General Vinoy advanced against them with some detachments, and at the same time a cavalry brigade under the Marquis de Gallifet, took them in flank. The Communist troops wavered and dispersed, and while trying to make good their retreat the guns of Mont Valérien opened upon them with dire effect. During the retreat the notorious Flourens was shot down fighting like a tiger at the head of his detachment. The centre column under General Eudes had no better fortune. It advanced at six o'clock in the morning towards Meudon, but after repeated attacks was driven behind the sheltering walls of Fort Issy. The left column, under Duval, kept up a protracted struggle, supported by the fire of Forts Issy, Vanves, and Montrouge, for nearly three days, when it was driven in, leaving its general in the hands of the enemy, by whom he was instantly shot. Nothing now remained for the Commune but to prepare to defend themselves within the city, for the Versaillists had determined on the bombardment of Paris, a proceeding which they had regarded as the acme of cruelty when inflicted by the Germans. The National Assembly had now brought together 150,000 men, a great number of whom were the soldiers of the Empire, liberated from the German prisons, and who were placed under the supreme command of M'Mahon. Thiers, who had been made president of the National Assembly, was unwilling to risk a combined attack upon the capital until almost morally sure of success; and weeks passed on without any decisive action taking place. Within the city disorder began to prevail: the Archbishop of Paris, several priests, and many respectable citizens were thrown into prison as hostages for the prisoners held by the Versaillists. The Vendôme Column, the monument of the first Napoleon's victories, was pulled down by order of the Commune. The houses of the rich were plundered by the roughs and the *dames de la Halle* (the market women). The Communist minister of war Cluseret, had given place to Rossel, and he again to Delescluze. By the end of April 128 batteries were in operation against the city. Early in May the Versaillists captured Fort Issy with 109 guns. On the 14th Fort Vanves was taken, and the Communists were thus hemmed in on all sides: on the west by the Germans, and on the three remaining sides by recaptured forts and the troops of the Assembly lying in the Bois de Boulogne. On Sunday the 21st an unexpected occurrence brought matters to a crisis. An advanced post of the 'regulars' were making observations at a short distance from the gate of St. Cloud, when they perceived a man waving a white

handkerchief. One of the party cautiously advancing learned that that part of the enceinte was entirely undefended, and telegraphed for troops to be immediately sent up. General Douay at once brought up his division, and after a sharp fight captured the gate of Auteuil. He was immediately followed by General L'Admirault leading the right wing, and General Cissey with the left wing of the army. By Monday the Versaillists, to the number of 80,000, were steadily forcing their way into the interior of the city. On Tuesday the Buttes Montmartre, and the Northern Railway station were in their hands, and Cissey and Vinoy were marching on the Hôtel de Ville and the Tuileries. That night the soldiers were fatigued, and rested. Then it was that the insurgents, in their wild despair, seem to have determined to bury themselves and their foes in the smoking ruins of the capital. The Tuileries, the Palais Royal, the Hôtel de Ville, the Palais de Justice, the Museum of the Jardin des Plantes, the library of the Louvre, and many other public and private buildings, fell a prey to the flames. The Archbishop of Paris and his fellow-hostages were brought out of prison and shot after a mock trial; criminals were let loose on condition of their slaughtering defenceless gendarmes, or carrying cans of petroleum to spread the conflagration. By Sunday, however, the soldiers had succeeded in crushing all opposition, yet not before many thousands of the rebels (among others Delescluze, Dombrowski, Eudes, Bergeret, and Rigault) had sold their lives dearly. Rossel, Assi, Rochefort, Grousset, and others, were made prisoners, and afterwards sentenced to be shot or banished. On the 30th May the city was placed by M'Mahon under four commands, comprising civil as well as military authority: that of the east under Vinoy; of the north-west under L'Admirault; of the south under Cissey; and of the centre under Douay. Soon after all summary executions ceased, and it was decreed that all Communist prisoners should be in future tried by a regularly constituted tribunal at Versailles. All the inhabitants of the city were disarmed, and the National Guard disbanded. The two months' reign of the Second Commune of Paris was now at an end.

COMMUNION. See LORD'S SUPPER.

COMMUNISM, an equality of distribution of the physical means of life and enjoyment, as a transition to a still higher standard of justice—that all should work according to their capacity, and receive according to their wants. The French writers on this subject profess to have founded their ideas on the republic of Plato, and on the writings of other Greek philosophers. They point to Sparta as a proof of the practicability of the theory, forgetting, singularly enough, that the Spartans left all productive labour to be done by their slaves. They assert that the social system promulgated by the founders of Christianity was purely communistic, and that the abortive attempt narrated in the Acts of the Apostles was a logical outcome of its social doctrines. They further trace the descent of their opinions through the Utopia of Sir Thomas More and the Oceana of Harrington. Communism continued for a long time the pleasing dream of speculative philosophers; but at last, when transplanted into France during the first revolution, it became a political force. Jean Bodin in his République, and Jean Morelly in his Code de la Nature, are the immediate precursors of the most dangerous spirits of that epoch. A manifesto published by this party declared the laws relating to the holding of lands as the 'brutal acts of an unprincipled soldiery. There is no difference among mankind but age and sex. They have all the same faculties and the same wants, and should have therefore the same food and the same education.' To comprehend how such ideas could have obtained currency, it must be remembered that France was morally and financially bankrupt; the lower classes were almost completely at the mercy of the upper; and that any change could scarcely make matters worse. The empire, however, was fatal to the development of the theory in the actual government of the country, and the splendid successes of Napoleon instilled martial rather than politico-social thoughts into the French mind. Thus driven from France, it sought acceptance in England, but in the hands of Robert Owen (which see) it only succeeded in attracting for a short time a suspectant curiosity and, latterly, supreme contempt. Owen found some imitators in America, whose fate has generally been similar to his own; but the ideas were warmly received by some French neophytes, who sought once more on their return to sow them on their most congenial soil. In the year 1845 a book written by Etienne Cabet (Voyage en Icarie) created such an enthusiasm among certain sections of Parisian society, that he was invited to head an association formed for the purpose of carrying his theories into practice. They set out in 1848 to found in the forests of Texas their Republic of Icaria, destined, they fondly believed, to serve as a model to all coming generations. At first they settled on a patch of uncleared land, which they failed in working to any advantage; they then occupied the territory of Nauvoo, from which the Mormons had been driven, and which was in an advanced state of cultivation, but even here they were equally unsuccessful. The association broke up in the course of a few months impoverished and almost starved. Its leader died at St. Louis, Missouri, in 1850, it is said of grief and disappointment. Meanwhile in France there had sprung up a host of teachers, all having different schemes for the regeneration of mankind or the creation of a perfect social system, each regenerator having the most supreme contempt for the scheme of his neighbour. The doctrines of St. Simon were ridiculed by Fourier, who in turn was satirized by Proudhon, and he again by Louis Blanc. The impracticability of Fourierism was demonstrated by an experiment made in 1830 to form a society under his instruction and superintendence. The society crumbled to pieces in a short time. Recently the doctrines of the Communists have been considerably influenced by the preachers of Socialism and by the Internationale. See SOCIALISM and INTERNATIONALE.

COMMUTATOR, a piece of apparatus used in connection with many electrical instruments for reversing the current from the battery. There are various forms, which will generally be found described with their proper instruments. One of the commonest kinds is described under RUHMKORF'S COIL.

COMNENI, an extinct family of sovereigns, according to an unsupported tradition, of Italian origin, which numbered, on the throne of Constantinople (from 1057 to 1204) and on that of Trebizond (from 1204 to 1461), eighteen emperors, besides nineteen kings and numerous independent princes (see BYZANTINE EMPIRE and TREBIZOND). When the Crusaders had overturned the throne of the Comneni in Constantinople, and established the Latin Empire there in 1204, a prince of the ancient house of the Comneni founded an independent state at Trebizond in Asia Minor, where he was governor. The last sovereign of this house was David Comnenus. From him, it is said, was descended Demetrius Comnenus, a French captain of dragoons, who died without children at Paris in 1821, with the title of *maréchal de camp*. But his descent cannot be historically traced. Ducange asserts without hesitation that Mohammed

II., the conqueror of Constantinople, after he had obtained the Empire of Trebizond, so called (which was scarcely as large as a French department), from the Emperor David, by a treaty, sent for this prince and his seven children to Constantinople. In order to get possession of the income which had been secured to the Greek prince he ordered him to be put to death, with all his children, at Adrianople in 1462, under pretence of a conspiracy. This is confirmed, according to Ducange, by all contemporary writers—Chalcondylas, Ducas, Phranzes. A remarkable member of the family was the Princess Anna Comnena, daughter of the Emperor Alexius I., who flourished in the first half of the twelfth century. See ANNA COMNENA.

COMO (anciently *Comum*), capital of the province of Como, in the north of Italy (Lombardy), 9 leagues N.N.W. of Milan, in a delightful valley on Lake Como. It is a bishop's see. The number of the inhabitants is about 20,000, many of whom travel about with small-wares, such as mirrors, spectacles, little pictures. Even in the time of the Roman emperors this taste for emigration manifested itself. The inhabitants of Como were then to be found in all parts of Italy in the capacity of masons. This city contains some antiquities, a splendid marble cathedral dating from the fourteenth century, and twelve beautiful churches; also a cabinet of natural history and natural philosophy. The eleventh and twelfth centuries were the flourishing period of Como. It was then at the head of the Ghibeline party, and the rival of Milan. Here were born Pliny the younger and Volta the natural philosopher. The province of Como has an area of about 1040 square miles, and a pop. of 454,651.

COMO, LAKE (*Lago di Como*, anciently *Lacus Larius*), a lake in the north of Italy, at the foot of the Alps. Towards the middle it is divided into two branches by the point called Bellaggio. The branch extending towards the south-west to the city of Como goes under the same name; that which turns to the south-east to Lecco takes the name of Lake Lecco. The length of the lake to Bellaggio is 5 leagues, that of the south-west branch 6 leagues, and that of the south-east branch 4 leagues. The greatest width is 1 league. More than sixty rivers and rivulets empty into it, and the Adda passes through it. It is about 700 feet above the level of the sea, and 191 feet above the territory of Milan. Lake Como, the most delightful of all the lakes in Upper Italy, is surrounded by mountains 3000 or 4000 feet high, which descend towards the lake, and terminate in hills surrounding terraces. It is bordered by delightful gardens and country seats. Many delicious fish, particularly trout, are taken in the lake. The neighbouring country is rich in minerals—iron, copper, and lead.

COMORIN, a cape forming the south extremity of Hindustan, and consisting of a low sandy point not visible from the deck of a ship at a greater distance than 12 to 16 miles. A much more conspicuous object is a lofty isolated mountain with a rounded summit, about 18 miles north of the cape, and known by the name of Comorin Peak.

COMORO ISLANDS, a volcanic group in the Indian Ocean, between the northern extremity of Madagascar and the continent of Africa. They are four in number—Angareja (called also *Comoro*), Mohilla, Johanna, and Mayotta. In 1843 France took possession of the last-mentioned island, the others are governed by independent chiefs, who take the dignified title of sultan. They are extremely fertile, well stocked with cattle, sheep, hogs, and birds of various kinds. They produce, likewise, sweet and sour oranges, citrons, bananas, honey, sugar-canes, rice, ginger, cocoa-nuts, &c. They are situated between lat. 11° 20′ and 13° 5′ S., and lon. 43° 10′ and 45° 30′ E. The population, consisting of negroes and Arabs, is estimated at 50,000. They are chiefly engaged in rearing cattle, and in the manufacture of coarse cloths, jewelry, and small arms. They are professed Mohammedans, but Fetish worship is customary.

COMPANIES, JOINT STOCK. See JOINT STOCK COMPANIES and PARTNERSHIP.

COMPANY, in military language, a small body of foot or artillery, the number of which varies, but in the British army is generally from 50 to 120, commanded by a captain, a lieutenant, and an ensign, and sometimes by a first and second lieutenant, as in the artillery and flank companies of the line. In the Austrian and Prussian armies companies are stronger, generally numbering about 250 men. In France the strength of a company has varied very much. In former times a company consisted of from 25, 30, 40, up to 200 men; in 1793, of 80 men; in 1808 they had 137 men, now it may range from 100 to 150.

COMPARATIVE ANATOMY is the science which investigates the anatomy of all animals with the view to compare them, to explain one by means of the others, and to group the various kinds according to their anatomical structure, and thence to deduce their affinities so as to form a natural classification. Comparative anatomy is one of the most interesting sciences. The want of an organ in certain classes of animals, or its existence under different modifications of form, structure, &c., cannot fail to suggest interesting conclusions concerning the office of the same part in the human subject. Thus comparative anatomy is of the highest importance to physiology. Haller observes, very justly, 'Physiology has been more illustrated by comparative anatomy than by the dissection of the human body.' Without comparative anatomy the natural history of animals would always have remained in a backward state, more so even than mineralogy without the aid of chemistry. And it is to comparative anatomy that we owe, in a great measure, that more liberal view of nature which belongs to modern times, and considers all nature, man included, as one unbroken whole. Cuvier's Leçons d'Anatomie comparée (in five large 8vo volumes) is an excellent work. Blumenbach's works on comparative anatomy, also, are highly valuable. His Handbuch der vergleichenden Anatomie und Physiologie (Göttingen, 1804) was translated into English under the title of, A Short System of Comparative Anatomy (London, 1807–8, 8vo). Especially valuable also are the writings of St. Hilaire, Spix, Oken, Carus, and among our own countrymen those of Goodsir, Huxley, and Richard Owen, whose genius has thrown light on every department of the science.

COMPARISON, DEGREES OF, in grammar, inflexions of adjectives denoting the degree in which a quality is possessed by a substance, either generally or in reference to other substances. The *positive* can scarcely be considered as a degree, as it denotes the quality generally without comparison. The *comparative* compares two conceptions only, the *superlative* compares one conception with any number of others, whether as denoting relative or absolute superiority. In English the comparative is generally formed by the addition of *er*, the superlative by the addition of *est*, to the positive of monosyllabic adjectives, or by the use of the words *more* and *most* when the adjective is of more than one syllable. Adverbs also are liable to comparison, which is effected by the same methods. There are some adjectives, such as *good, better, best; little, less, least*, that do not form their degrees of comparison in the regular manner.

COMPASS, an instrument for showing the magnetic north and south. Under MAGNETISM (TERRESTRIAL) it is explained that a magnetized bar, free to move in a horizontal plane, always takes up a position very nearly invariable at any given place. It sets, in fact, in such a position that the needle, if it be thin and magnetized from end to end, points in the direction of the magnetic north and south. If then we know for any particular place the *compass declination*, that is, the angle which the magnetic north and south line makes with the geographical north and south line, the latter is determined. In the sailing charts used by seamen, this angle, which varies from place to place, is always indicated, and the compass is used both for directing the ship and for determining her place when within sight of land or of lighthouses.

The compass, in its simplest form, consists of a magnetized bar of iron supported on a point, so as to be free to turn in a horizontal plane. A small hole is generally bored through the bar, and a small conical cup of agate or ruby is let into the hole. The agate or ruby cup rests on a hard steel needle-point. A support of this kind allows the magnetic bar to turn with as little friction as possible. Beneath the bar is placed a *compass-card*, on which is traced a star with thirty-two rays called the *points of the compass* or *rhumbs*, or in some cases the card is divided into degrees, minutes, and seconds.

COMPASS, MARINER'S, a form of compass specially adapted for use at sea. A thin circular sheet of mica is supported so as to turn with great freedom in a horizontal plane about its centre. This is called the *compass-card*. The bearing usually consists of a small plate of agate let into the card, and has a conical hole at the centre, and this rests on a fine needle-point of hard steel. This arrangement gives very little friction. To the under surface of the compass-card a magnet is attached, or often in the best instruments several parallel magnets. Many experiments have been made to find the best arrangement for the magnets, but there is probably still something to be learned on this question. The compass-card is marked with a star of thirty-two rays, which are called the *rhumbs*, or the points of the compass. A line joining two of these points diametrically opposite is or ought to be exactly parallel with the magnetic axis of the arrangement below; and at the extremities of these points are marked N. (north) and S. (south). E. and W. are marked at the extremities of another diametral line at right angles to the first. The other points have also names (see RHUMBS); and to repeat these from memory in order, beginning at N. and going round the whole circle, is what sailors call *boxing the compass*.

The card is supported, as we have said, on a steel point, which is attached either to a hemispherical bowl of thick copper, or to a thick copper ring when the compass is to be used for night-sailing, in which case a lamp placed below the ring shines up through the mica card and makes the markings on it visible. This thick copper bowl or ring is called the compass-box. Its use is to *damp* the vibrations of the needle; for it is found (see MAGNETO-ELECTRIC INDUCTION) that the presence of a large mass of copper properly placed damps the vibrations of a freely-suspended magnet rapidly, while it does not at all prevent it from coming to rest in the proper position. The compass-box is suspended on *gimbals*, which are two concentric copper rings. The larger turns on a horizontal axis, whose extremities rest on the inside of the case that contains the compass. The smaller ring turns on a horizontal axis at right angles to the former, and resting on the outer ring. The compass-box is attached to the inner ring, and its weight tends to keep both horizontal. Thus supported, the compass-box and card always remain horizontal however the ship rolls or pitches. (For the use of the compass see COMPASS, and also MAGNETISM—TERRESTRIAL.) The chief difficulty in making use of the compass arises from the magnetism of the ship itself. In iron ships particularly, the magnetism of the ship greatly interferes with its indications. The effect of the ship's magnetism is determined by *swinging* the ship, and determining a correction to be applied for every position. This, however, is liable to some uncertainty, for it is found that rough weather and other circumstances alter the magnetism of the ship, and therefore its effect on the compass. It is usual to place a compass at the mast-head of large ships, and from time to time to compare the deck compass with it.

The origin of this instrument cannot be traced with anything like certainty. There is reason to believe that the Chinese knew something about the polaric property of loadstone more than 2000 years before the Christian era. In the year 1242 A.D. Bailak Kibdjaki gave an explicit description of a primitive kind of compass in common use on the Syrian coast; and it is said that on the return of Marco Polo from Cathay, in 1260, he brought a knowledge of this as well as several other Chinese inventions with him. The Italians ascribe the invention of the compass to Flavio Gioja, a native of Amalfi, giving the dates 1300–20, but it is obvious from the dates given above that he can be credited only with some important improvement of the instrument. The discovery of the variation of the needle has been generally attributed to Columbus, but is now supposed to have been known much earlier.

COMPASSES, or PAIR OF COMPASSES, a mathematical instrument, used for the describing of circles, measuring lines, &c. The common compasses consist of two branches or legs of iron, brass, or other metal, pointed at bottom, and joined by a rivet, whereon they move as on a centre.

COMPASS OF THE VOICE. See VOICE (COMPASS OF THE).

COMPENDIUM, properly an abstract or abridgment, was in the middle ages the name usually given to a book or register, in which the property belonging to each individual citizen was shortly entered. It is now commonly used to designate a manual containing in a compact form any of the elements of any branch of knowledge.

COMPENSATION, in Scotch law, a sort of right by *set-off*, whereby a person who has been sued for a debt may be compensated with what is owing him by the pursuer, which in that case is equal to payment. *Compensatio injuriarum*, a plea frequently met with as a defence against actions of damages for slander or defamation. It is not properly a bar to the action, but a sort of counter claim which extinguishes or modifies the pursuer's claim. The injuries thus set off against each other must, generally speaking, be of the same nature. In England it is not permitted to set off one trespass or wrong against another, a cross action is necessary; and recently the leaning of judicial authority in Scotland has been in favour of a separate action.

COMPIÈGNE, a French town, department and left bank river Oise, 45 miles N.N.E. of Paris. It has about 12,200 inhabitants, crooked streets and ill-built houses, and some manufactures and commerce. Formerly it was supported only by the court, which occasionally resided here. The splendid château, surrounded by its extensive and beautiful park, bordering on the celebrated forest of Compiègne, was a favourite autumnal residence of Napoleon III. It has two fairs, one in April and one in November. Charles VI. took this town from the Duke of Bur-

gundy in 1415. In 1430 Joan of Arc was taken prisoner here by the English. In July, 1871, the German army of occupation, under Manteuffel, here established its head-quarters.

COMPLEXION. The human skin, till the time of Malpighi, was supposed to consist only of two parts—the cuticle, epidermis, or scarf-skin; and the cutis or real skin; but that anatomist, about the middle of the seventeenth century, discovered between these a cellular texture, soft and gelatinous, to which the names of *rete mucosom* and *corpus reticulare* have been given. He demonstrated the existence of this membrane, at first in the tongue and in the inner parts of the hands and feet; but by his subsequent labours, and also by those of Ruysch and other anatomists, it has been proved to exist, between the epidermis and cutis, in all parts of the human body. Malpighi, on the discovery of this membrane, offered a conjecture respecting the cause of the colour of negroes. He supposed that this membrane contained a juice or fluid of a black colour, from which their blackness arose. The actual existence of a black pigment has been since ascertained, but has never been procured in sufficient quantity to admit of minute and analytical examination. The *rete mucosum* is of very different colours in different nations; and the difference of its colour so completely agrees with the difference of their complexions, that there can be no doubt that it is the sole, or, at least, the principal seat of the colour of the human complexion. Its thickness varies in different parts of the body; and the depth of its colour, for the most part, is in proportion to its thickness. The black colour of the negroes is destroyed by several causes; indeed, whatever destroys the *rete mucosum* destroys it, as wounds, burns, &c.; and as this membrane is never reproduced, the scar remains white ever afterwards. Hawkins (in his Travels into the Interior of Africa, p. 120) mentions that the land-cloud of Africa, called by the Portuguese *ferrino*, changes the black colour of the negroes into a dusky gray; according to some other authors, the change is into a red copper colour. At Darfur a species of leprosy prevails among the natives which they call *borras*, and which gives them the appearance of being piebald, changing to a white colour parts both of their skin and their hair. There are, also, several instances of the colour of negroes being either entirely or partially changed, from the operation of causes which cannot be detected or explained. A boy who was born in Virginia of black parents, continued of his native colour till he was three years old: at that period a change of colour began to take place, though the health of the boy continued good, and there was no assignable cause for the alteration, in his food or mode of life. At first white specks made their appearance on his neck and breast, which soon increased in number and size; from the upper part of his neck down to his knees, he was completely dappled; his hair was also changed, but not to the same degree, since, though some parts of it were white, in general it retained the black colour and crispature of the negro. The colour of those parts of his body which had undergone the change was of a more livid white than is found among the fairest Europeans; nor did the flesh and blood appear through these parts of his skin so clear and lively as through the skin of white people. He was not liable to be tanned.

The nature and colour of the hair seem closely connected with the complexion. In proportion to the thinness of the skin and the fairness of the complexion the hair is soft, fine, and of a white colour: this observation holds good not only in the great varieties of the human race, but also in the albinos. Next to them in fairness of complexion is the Gothic race, the *rutilæ comæ* of whom were a distinguishing characteristic, even in the time of the Romans. The Celtic tribes are not so fair as the Gothic, and their hair is darker and more inclined to curl; so that the observation which Tacitus makes respecting the Silures still applies to them—'Colorati vultus, torti crines.' But though the colour of the hair is evidently connected with the complexion, yet its tendency to curl does not appear to be so. The brown-complexioned Celts have curled hair; the Mongolian and American varieties, of a much darker complexion, have hair of a darker colour, but long and straight. Among that portion of the Malay variety which inhabits the South Sea Islands, soft and curled hair is frequently met with. The colour of the eye is also connected with the complexion. In the Africans, Professor Sommering remarks that the *tunica adnata*, or white of the eye, is not so resplendently white as in Europeans, but rather of a yellowish-brown, something similar to what occurs in the jaundice. The iris in the negroes, in general, is of a very dark colour; but, according to Pigafetta, the iris in the Congo negro is frequently of a bluish tinge. The Gothic tribes are not more distinguished by their fair complexion than by their blue eyes (*cærulei oculi*), while the iris of the darker coloured Finn, according to Linnæus, is brown, and that of the still darker Laplander black. The colour of the eyes also follows, in a great degree, in its changes, the variations produced by age in the complexion. Blumenbach informs us that newly-born children in Germany have generally blue eyes and light hair, both of which become gradually of a darker hue as the complexion of the individual grows darker; and Ligon, in his True and Exact History of Barbadoes (p. 52), says that the children of the negroes there, when they are born, 'have the sight of their eyes of a bluish colour, not unlike the eyes of a young kitten; but as they grow older they become black.' The most singular class of men in point of complexion are the albinos. (See ALBINOS.) A middle complexion is produced where children are born from parents of different races. If the offspring of the darkest African and the fairest European intermarry successively with Europeans, in the fourth generation they become white; when the circumstances are reversed, the result is reversed also. Along with the successive changes of complexion is also produced a change in the nature and colour of the hair; though, in some instances, the woolly hair remains when the complexion has become nearly as fair as that of brown people in Europe. It does not, however, always happen that the offspring is the intermediate colour between that of the respective races to which the father and mother belong; it sometimes resembles one parent only, while, perhaps, in the second or third generation, the colour of the other parent makes its appearance. White, on the Regular Gradation of Man, mentions a negress who had twins by an Englishman: one was perfectly black; its hair was short, woolly, and curled: the other was white, with hair resembling that of a European. And Parsons, in the Philosophical Transactions, gives an account of a black man who married an English woman: the child, the offspring of this marriage, was quite black. The same author gives another instance still more remarkable: a black in Gray's Inn married a white woman, who bore him a daughter, resembling the mother in features, and as fair in all respects, except that the right buttock and thigh were as black as the father's.

The generally received opinion concerning the varieties of complexion which are found in the different races of man throughout the globe is, that they are caused entirely by the influence of climate. Respecting the primary colour of man the supporters of this opinion are not agreed. The opinion that

climate alone will account for the various complexions of mankind is very plausible, and supported by the well-known facts that in Europe the complexion grows darker as the climate becomes warmer; that the complexion of the French is darker than that of the Germans, while the natives of the south of France and Germany are darker than those of the north; that the Italians and Spaniards are darker than the French, and the natives of the south of Italy and Spain darker than those in the north. The complexion also of the people of Africa and the East Indies is brought forward in support of this opinion; and from these and similar facts the broad and general conclusion is drawn, that the complexion varies in darkness as the heat of the climate increases; and that, therefore, climate alone has produced this variety. But it can be shown that the exceptions to this general rule are very numerous; that people of dark complexions are found in the coldest climates, people of fair complexions in warm climates, people of the same complexion throughout a great diversity of climate, and races differing materially in complexion dwelling near together.

1. In the coldest climates of Europe, Asia, and America we find races of a very dark complexion. The Laplanders have short, black, coarse hair; their skins are swarthy, and the irides of their eyes are black. According to Crantz the Greenlanders have small, black eyes; their body is dark-gray all over; their face brown or olive; and their hair coal-black. (Crantz's History of Greenland, i. 132.)

The complexion of the Samoiedes, and the other tribes who inhabit the north of Asia, and of the Esquimaux, is very similar to that of the Laplanders and Greenlanders. Humboldt's observations on the South American Indians illustrate and confirm the same fact. If climate rendered the complexion of such of these Indians as live under the torrid zone, in the warm and sheltered valleys, of a dark hue, it ought also to render or preserve fair the complexion of such as inhabit the mountainous part of that country; for certainly, in point of climate, there must be as much difference between the heat of the valleys and of the mountains in South America as there is between the temperature of southern and northern Europe; and yet this author expressly assures us 'that the Indians of the torrid zone, who inhabit the most elevated plains of the Cordillera of the Andes, and those who, under the forty-fifth degree of south latitude, live by fishing among the islands of the archipelago of Chonos, have as coppery a complexion as those who, under a burning climate, cultivate bananas in the narrowest and deepest valleys of the equinoctial region' (Political Essay on the Kingdom of New Spain). He adds, indeed, that the Indians of the mountains are clothed, but he never could observe that those parts which were covered were less dark than those which were exposed to the air. The inhabitants also of Tierra del Fuego, one of the coldest climates in the world, have dark complexions and hair.

2. Fair-complexioned races are found in hot climates. Ulloa informs us that the heat of Guayaquil is greater than at Carthagena; and by experiment he ascertained the heat of the latter place to be greater than the heat of the hottest day at Paris; and yet in Guayquil, 'notwithstanding the heat of the climate, its natives are not tawny;' indeed they are 'so fresh-coloured, and so finely-featured, as justly to be styled the handsomest, both in the province of Quito and even in all Peru.' In the forests of Guiana, especially near the sources of the Orinoco, are several tribes of a whitish complexion—the Guiacas, the Guagaribs, and Arigues—of whom several robust individuals, exhibiting no symptom of the asthenical malady which characterizes albinos, have the appearance of true Mestizos. Yet these tribes have never mingled with Europeans, and are surrounded with other tribes of a dark-brown hue.' The inhabitants of Boroa, a tribe in the heart of Araucania, are white, and in their features and complexion very like Europeans. Even in Africa darkness of complexion does not increase with the heat of the climate in all instances; the existence of comparatively fair races in this quarter of the globe is noticed by Ebn Haukal, an Arabian traveller of the tenth century, and has been confirmed by subsequent travellers.

3. The same complexion is found over immense tracts of country, comprehending all possible varieties of climate. The most striking and decisive instance of this is on the continent of America, all the inhabitants of which, with the exception of the Esquimaux, exhibit the copper-coloured skin and the long and straight black hair. Australia is an instance of a similar nature, though on a less extensive scale: over the whole of the island, even in the very cold climate of the southern parts, the complexion of its inhabitants is of a deep black, and their hair is curled like that of negroes.

4. Different complexions are found under the same physical latitude, and among the same people. Illustrations and proofs of this have already been given. The physical latitude in which the Norwegians, the Icelanders, the Finns, and the Laplanders live scarcely differs; and yet their complexions, and the colour of their eyes and hair, are widely different. There is a great diversity of colour and features among the Morlachi, who inhabit Dalmatia. The inhabitants of Kotar, and of the plains of Seigu and Knin, have fair blue eyes, broad face, and flat nose. Those of Duare and Vergoraz, on the contrary, have dark-coloured hair; their face is long, their complexion tawny, and their stature tall. (Fortis's Travels in Dalmatia, p. 51.) M. Sauchez, who travelled among the Tartars in the southern provinces of Russia, describes a nation called the Kabendedski as having countenances as white and fresh as any in Europe, with large black eyes. In the south of Africa we find the Caffres, who are of a brown or iron-gray colour, and the Hottentots of a yellow colour. In the island of Madagascar there are three races, distinctly marked. The first are black, with frizzled hair, supposed to be the original inhabitants of the island. The second race inhabit the interior provinces; they are tawny, and have long hair like the Malays. The third race reside near Fort Daupliris, and on the west coast; they are supposed to be descended from some shipwrecked Arabs, and retain a resemblance to that nation.

People with the negro complexion and features are also found in the interior of the Philippine Islands; and in Java the Hindu and Malay character may be clearly traced in the complexion and features of the two classes of inhabitants which are found in that island. In several of the Moluccas is a race of men who are blacker than the rest, with woolly hair, inhabiting the interior hilly parts of the country. The shores of these islands are peopled by another nation, whose individuals are swarthy, with curled long hair. In the interior hilly parts of Formosa the inhabitants are brown, frizzle-haired, and broad-faced; while the Chinese occupy the shores.

Forster observes that there are two great varieties of people in the South Seas; the one more fair, the other blacker, with their hair just beginning to be woolly and crisp. The first race inhabits Otaheite and the Society Isles, the Marquesas, the Friendly Isles, Easter Island, and New Zealand; the second race peoples New Caledonia, Tanna, and the New Hebrides, especially Mallicolo. If we examine the

relative situation and latitudes of these islands on a map, we shall be convinced not only that darker complexioned people are found where the climate is comparatively colder, but that the same complexion is found under very different latitudes. It is not meant to be denied that a burning climate will render the complexion very dark, and that a climate of less extreme heat will bronze the complexion of the fairest European; but there are some material points in which the dark complexion of the Caucasian, or naturally fair-skinned variety of mankind, caused by climate, differs from the dark complexion of all the other varieties of the human race.

1. The offspring of the Caucasian variety is born fair; the offspring of the other varieties is born of the respective complexion of their parents. Ulloa informs us that the children born in Guayaquil of Spanish parents are very fair. The same is the case in the West Indies. Long, in his history of Jamaica, expressly affirms 'that the children born in England have not, in general, lovelier or more transparent skins than the offspring of white parents in Jamaica.' But it may be urged that this is not the case with respect to the other nations of the Caucasian variety, who have been settled in warm climates from time immemorial, and that the question ought to be decided by the Moors, Arabians, &c. Their children, however, are also born fair-complexioned, as fair as the children of Europeans who live under a cold climate. Russell informs us that the inhabitants of the country round Aleppo are naturally of a fair complexion, and that women of condition, with proper care, preserve their fair complexion to the last (Russell's Aleppo). The children of the Moors, according to Shaw, have the finest complexions of any nation whatsoever; and the testimony of Poiret is directly to the same effect:—'The Moors are not naturally black, but are born fair, and when not exposed to the heat of the sun remain fair during their lives.'

2. Individuals belonging to the Caucasian variety, that inhabit warm countries, preserve their native fairness of complexion if they are not exposed to the influence of the climate; while there is a uniform black colour over all the parts of a negro's body. The hue which Europeans assume is the same, though the tinge may be lighter or darker, whether they settle in Africa, the East Indies, or South America. They do not become, like the natives of those countries, black, olive-coloured, or copper-coloured; their complexion merely resembles that of a tanned person in this country, only of a darker tinge. The negroes that are settled in the West Indies or America do not assume the copper-colour of the Indians, even though a milder climate may have some effect on the darkness of their complexions. The children of Europeans, of negroes, and of Indians, are all born, in America, of the same reddish hue; but in a few days those of the negro begin to assume the black complexion of their parents, those of the Indian the copper complexion, while those of the European either continue fair, if kept from the influence of the sun, or become tanned; not black like the negro, or copper-coloured like the Indian, if exposed to its influence. Europeans who settle in Canada, or in the northern parts of America, where the climate resembles that of their native country, do not assume the complexion of the Indians, but continue fair like their ancestors. The same observation may be made respecting the Russians who are settled among the Mongolian variety, in those parts of the Russian Empire in Asia, the climate of which resembles the middle or northern parts of European Russia. Indeed the wide extent of country over which the Mongolian variety is spread, including the extreme cold of Lapland and the north of Asia, the mild temperature of the middle parts of that continent, and the warmth of the southern parts of China, is in itself a proof that dark complexion does not arise either from the influence of heat or cold.

Lastly, radical varieties of complexion are always accompanied with radical varieties of features. We do not find the olive-colour of the Mongolian variety with the features of the Malay; nor the brown colour of the Malay with the features of the Mongolian; nor the black skin of the Ethiopian variety, or the red colour of the American, united with any set of features but those which characterize their respective varieties. It, however, by no means follows that the hypotheses of different races having been originally formed must be adopted, because climate is not adequate to the production of the radical varieties of complexion which are found among mankind. Man, as well as animals, has a propensity to form natural varieties; and the variations may in process of time involve all the tissues so as to yield permanent differences in colour and quality of hair, colour of skin, size and form of bones, especially those of the skull and limbs.

COMPLUTENSIAN POLYGLOT. See POLYGLOT.

COMPOSITÆ, in botany, is the largest of all known natural groups of plants; and so termed from the fact that the older botanists regarded the flower-heads as compound flowers. They correspond to the Syngenesia Polygamia of Linnæus, and are positively characterized by having capitate flowers, syngenesious anthers, and an inferior ovary with a single erect ovule. Lindley calls the order Asteraceæ, and estimates the number of genera at over 1000, and the species at above 9000. They exist wherever vegetation can develop. They are sometimes trees, but more frequently herbaceous plants and shrubs. As belonging to this order we may specify wormwood, camomile, southernwood, elecampane, the lettuce, succory, endive, artichoke, the aster, dahlia, sunflower, &c.; but by far the greater number are weeds of no ascertained use.

COMPOSITE ORDER. See ARCHITECTURE.

COMPOSITION. See BANKRUPTCY.

COMPOSTELLA, a city of Spain, capital of Galicia, situated in a beautiful plain, 98 miles west of Astorga; pop. about 28,970. It is the see of an archbishop. The cathedral dates as far back as the eleventh century. In former times Compostella was considered throughout Christendom as a sacred city, and a pilgrimage to it was deemed almost as meritorious as one to Jerusalem. A university was established here in 1532, the only one in Spain besides that of Madrid, which possesses six faculties.

COMPOSTS, in agriculture, are combinations of manures, the advantage of which lies in this, that the combined influence of the component parts is greater than the sum of their several fertilizing effects if they had been used separately. By a proper adoption of the system many fertilizers which are otherwise of no value might be made of great use. Animal, vegetable, and mineral substances are found on the farm—valuable fertilizers when properly applied—which are advantageously preserved in the form of compost. Roots, ferns, weeds, peat, saw-dust, &c., when properly decomposed, form good manures. Animal substances, such as carcasses, blood, bones, fish, are much more valuable than some of the most highly esteemed artificial manures, as containing a greater quantity of nitrogen. Animal remains of every kind which undergo putrefactive fermentation so rapidly that unless they are ploughed in immediately they soon lose their valuable properties, may, by being mixed in the compost heap with earth,

ashes, or charcoal, be preserved for any length of time. The waste fluids from stables and farm-yards are excellently preserved by forming a compost with vegetable and earthy refuse. Composts are valuable also by bringing into use many substances which are not fit for application to the soil. Sods, turf, sawdust, weeds, and all the vegetable matter collected on the farm, must either be subjected to fermentation in the compost heap, or mixed with lime, before the seeds of weeds or the larvæ of insects are killed. Another advantage secured by compost is that it secures the more equable diffusion of powerful manures. Guano can be used in combination with earth or ashes drilled evenly, and bones, either fermented with water or dissolved by acid, may be distributed in the same way. But apart from the addition of chemical ingredients useful to the crop, composts have another advantage not to be overlooked. To soils of a stiff nature composts formed of a large bulk of animal and fibrous matter may be applied with results far beyond that of immediate benefit to the crop. Such an application, by its mechanical agency in altering the texture of the soil, improves its physical properties, gives freer access to the sun and air, and increases its general productiveness to a considerable extent. Light soils may be improved by bulky applications of composts which contain lime, clay, and other minerals in which they are deficient. The portability and certainty of effect of artificial manures, and the labour of admixture and cartage of composts, have induced farmers to look with less favour on the latter. But if the proper time was taken, when men and horses were comparatively at leisure, a great quantity of compost could be got together with little apparent effort.

COMPOUND AMMONIAS, a large and very important class of bodies derived from ammonia by replacement of part of the hydrogen with alcoholic and other carbon radicals. They are divided into sub-groups according to the nature of the radicals introduced. They are all basic in function, combining with acids to form crystalline salts. They have an alkaline reaction, and some are volatile and pungent like ammonia itself. They are of great importance in the investigation of the constitution of various organic bodies.

COMPOUND BLOWPIPE. See OXYHYDROGEN BLOWPIPE.

COMPOUNDING OF FELONY, in English law, is where the party robbed not only knows the felon but actually takes his goods again, or some amends, upon an agreement not to prosecute; this offence is punishable by fine and imprisonment. To take any reward for helping a person to stolen goods, without bringing the offender to justice, is felony; and to advertise a reward for the return of stolen property incurs a penalty of £50.

COMPOUND RADICAL. See CHEMISTRY.

COMPRESSIBILITY. All bodies are probably compressible, though the liquids are but slightly so. Those bodies which occupy their former space, when the pressure is removed, are called *elastic*.

COMTE, FRANÇOIS CHARLES LOUIS, a distinguished writer on politics and jurisprudence, was born at St. Enimie, in the department of Lozère, in 1782. On the restoration of the Bourbons he was practising as an advocate in the royal court of Paris, but to his strong republican tendencies, the military despotism of Napoleon, and the absolutism of the old régime, were equally repugnant, and he determined to withdraw from his profession and devote himself exclusively to the advocacy of liberal opinions. In 1814 he united with his friend M. Dunoyer in starting a journal, called Le Censeur, in which the adherents both of Napoleon and the Bourbons were roughly handled. Bonaparte, on his return from Elba, made advances to him, and was willing to have made him advantageous offers, but met with the most decided refusal. On the second restoration of the Bourbons judicial proceedings were taken against the Censeur, and judgment obtained, condemning the editors to a year's imprisonment and a fine of 3000 francs. In 1819, when the hostility to the press appeared to be somewhat relaxed, M. Comte converted his journal into a daily newspaper, under the name of Le Censeur Européen, and shortly after amalgamated it with the Courrier Français. In 1821 a new prosecution condemned him to two months' imprisonment and a fine of 2000 francs. He evaded the judgment by retiring to Geneva, where he obtained a chair of public law, and taught with great success till the Helvetic diet, in consequence of diplomatic complaints, saw it necessary to refuse him an asylum. He withdrew to England, where he remained eighteen months, and then returned to France, when the revolution of 1830 gave him hopes of a new and better order of things. He at first took office under Louis Philippe, but soon after resigned it, and as a member of the chamber of deputies took his seat on the extreme left. The work by which his name will be best known to posterity is his Traité de Législation Criminelle (four vols. Paris, 1827; second edition, 1835). He died in 1837.

COMTE, ISIDORE AUGUSTE MARIE FRANÇOIS XAVIER, founder of the 'positive' system of philosophy, was born at Montpellier on 12th January, 1798. His family were zealous Catholics and royalists, but he himself adopted very opposite sentiments at an early period of life. He was educated at the École Polytechnique, and embraced enthusiastically the socialist tenets of St. Simon, which became greatly in vogue in France after the restoration. As one of his most distinguished pupils, he was employed, in 1820, to draw up a formula of the doctrines professed by the St. Simonian school, which he accordingly accomplished in his Système de Politique Positive. This work did not, however, meet with the entire approbation of St. Simon, who asserted that Comte had made a very important omission by overlooking the religious or sentimental part of human nature. In 1826 he commenced a course of lectures on mathematics, and had for an audience such men as Humboldt, Blainville, Carnot, &c., but only a few lectures were given when he was attacked by a brain fever, from which, after a short time, he recovered. In 1830 he commenced the publication of his Cours de Philosophie Positive, which was completed in six volumes in 1842, and was freely translated into English and condensed by Harriet Martineau (two vols. 1853). The following is an abstract of the philosophical system propounded by Comte in that work. It consists of three leading positions. The first is, that the human mind in its progress, historically and individually, passes through three stages of development:—1. The theological, in which all the phenomena of nature are imputed to the active agency of the gods. 2. The metaphysical, in which the gods are supplanted by certain abstractions called 'nature,' 'harmony,' 'number,' &c.; and 3. The positive or scientific, in which it is discerned that man can know nothing of causes, and is only able to refer phenomena to their general laws of existence or succession. Arrived at this stage, science is born, and knowledge, no longer baffled by the inscrutable or misled by the imaginary, advances from one generalization to another, to a comprehensive perception of the universe as a whole. The second position is, that in this advance the mind proceeds in a regular hierarchical order, from the simple to the complex, or from the most elementary relations of numbers to the highest and deepest complications of society and life. The

hierarchical order of the sciences is arranged by Comte as follows:—1. The most general and simple of all, dealing only with numbers and magnitudes—mathematics. 2. The application of the principles of mathematics to the phenomena of the celestial sphere, or astronomy. 3. The application of mathematics and astronomy to the phenomena of the terrestrial sphere or general physics, including heat, light, optics, electricity, &c. 4. The science of the phenomena of individually organized being, or vegetable and animal life, termed biology; and 5. The science of the phenomena of corporate or social life, which he terms *sociology*, and which, as presupposing and containing all the former, he represents as the essence and perfection of all the sciences. The third position lays down the laws and principles which regulate social life, constituting order and liberty. The first element of order is the family; the second the community, composed not of individuals but of families, and co-operating, to a certain extent, in their employment; and the third, the government or state. Liberty is the effect of this harmonious organization, and progress the development of it, by the conquest—(1) of material nature; (2) of the lower propensities by the higher intellectual faculties; and lastly, of the selfish passions by the noblest social affections. In 1832 he became one of the professors at the École Polytechnique. In 1843 he published a mathematical work, entitled Traité Élémentaire de Géometrie Analytique; and in 1848 a Discours sur l'Ensemble du Positivisme, in which the doctrines laid down in his previous work are recapitulated. But some change had, in the interval, taken place in Comte's views. The death of a lady, whom he calls Clotilde, and for whom he had conceived the most ardent affection, impressed his mind deeply with the conviction that something more than a mere material array of facts was needed to satisfy the cravings of the human soul. The religious tendencies of the heart had been hitherto wholly overlooked by him, and he now perceived the necessity of presenting some object to supply this want. He invented a religion which consists in referring the whole harmony of existence to, and concentrating its essence in one great Being, whom he termed Humanity. As manifestations and representatives of this Being, he maintained that the proper objects of worship are those who have shown themselves the greatest benefactors to the human race—in fact, a hero-worship. This system is propounded by him in a book published in 1849, entitled Culte Systematique de l'Humanité: Calendrier Positiviste, ou Système Général de Commemoration Publique, in which he has drawn up a regular calendar of demigods, presiding over the months, weeks, and days of the year, and having each their appropriate festivals. The thirteen months into which he divided the year he called *Moses, Homer, Aristotle, Archimedes, Cæsar, St. Paul, Charlemagne, Dante, Gutenberg, Shakspeare, Descartes, Frederick*, and *Bichat*. He himself assumed the office of high-priest of this new religion, performing marriage and funeral rites on behalf of the disciples who had been induced to adopt his system. These, however, were never very numerous, and by the time of his death had nearly all dropped off one after another. Some disagreements with his brother professors at the École Polytechnique led to his losing his chair there, and latterly he became entirely dependent upon the generosity of sympathizers such as John Stuart Mill, Grote, Littré, and others. The last work published by him was entitled Système de Politique Positive, ou Traité de Sociologie, instituant la Religion de l'Humanité, issued in 1851–52. He died at Paris of disease of the heart on 5th Sept. 1857, and was buried in the cemetery of Père la Chaise. However extravagant many of Comte's theories may appear to be, they nevertheless display in their enunciation a powerful intellect with much universality and comprehensiveness of knowledge. Many new and original ideas are brought forward, and much matter afforded for thought and reflection. His works have been made known to English readers mainly by Mr. G. H. Lewes' Comte's Philosophy of the Sciences and Miss Martineau's translation above mentioned.

COMUS (from the Greek), the name of a merry company of young people, who came singing into the houses of their friends and mistresses, to entertain them with their music. Comus was also the name of the songs sung at festive entertainments. This name is not given by early ancient writers whose works have been preserved, to a divinity presiding over such meetings, who is a creation of later times, which gave him the name of the festive songs in which were celebrated the praises of the giver of social joys. He is first mentioned by Philostratus.

CON, an Italian preposition signifying *with*, and of frequent occurrence in musical phraseology; *con amore*, with feeling; *con brio*, brilliantly; *con gusto*, with taste, &c.

CONCAN, a maritime subdivision of Hindustan, in the presidency of Bombay, and the provinces of Aurungabad, Deccan, and Bejapoor. It consists of a long belt of sea-coast, stretching from north to south for about 220 miles, with an average breadth of 35 miles, and bounded on the east by the Western Ghauts. Pop. 1,250,000. It is divided into North and South Concan, and though the surface is much broken, contains many spots well adapted for cultivation. One of the most important crops is hemp.

CONCARNEAU, a seaport, France, dep. Finistère, on an island in the bay of La Forêt, 12 miles S.E. Quimper; pop. 3555. It consists of the town proper, surrounded by walls, and of suburbs more extensive than the town itself; and has a harbour somewhat difficult of access, but with good anchorage for vessels of 500 tons. From 15,000 to 20,000 barrels of sardines are here exported every year.

CONCAVE. See CONVEX.

CONCAVE LENS, an epithet for glasses ground hollow on the inside, so as to reflect on the hollow side.

CONCENTRATION, in chemistry, the act of increasing the strength of solutions. This is effected in different ways: by evaporating off the solvent, as is done in the separation of salt from sea-water; by distilling off the more volatile liquid, as in the rectification of spirit of wine; by the use of low temperatures, as in the purification of benzol; by difference of fusibility, as in Pattinson's process for desilverizing lead.

CONCENTRIC, similar figures having a common centre are called concentric.

CONCEPCION, or CONCEPCION-LA-NUEVA, CONCEPCION-DE-MOCHA, CONCEPCION-DE-PENCO, a seaport of Chili, capital of a province of the same name, 270 miles S.S.W. Santiago, on the right bank of the Biobio, 7½ miles from its mouth. It is the seat of a bishop and of a military commandant of the district and of the forts along the Biobio, and is a well-built town, with wide and clean streets crossing at right angles. The chief public establishments are hospitals, an orphan asylum, a lyceum, a theatre, a prison, barracks, &c. Near the centre is a square with a handsome fountain. There is a cathedral, and also several churches and free schools. Its port at Talcahuano, a small fortified town on the Bay of Concepcion, about 8 miles distant, is one of the best in Chili. The bay forms an extensive and excellent roadstead, and is shut in by the island of Quiriquina, on either side of which is a channel. Trade in timber, grain, hides,

tallow, and salted beef; in the vicinity of Penco is an important coal mine. Concepcion was founded, 1550, by Pedro Valdivia, on the south side of Concepcion Bay. In 1554, 1555, and 1603 it was taken and burned by the Araucanians, and as often rebuilt; and in 1730 it was destroyed by an earthquake, and a great part of it swallowed up by the sea. It was again destroyed by an earthquake in 1751; after which the town was rebuilt on its present site. The Araucanians again devastated a portion of it in 1823; and in 1835 a terrible earthquake almost laid it in ruins. It has since recovered, has been rebuilt in a better style, and has now a population of about 14,000.

CONCEPTION, IMMACULATE. The belief is entertained in the Roman Catholic Church that the Virgin Mary was born without the stain of original sin. St. Bernard, in the twelfth century, rejected this doctrine, in opposition to the canons of Lyons, and it afterwards became a subject of vehement controversy between the Scotists and the Thomists. The Dominicans espoused the opinion of St. Thomas, the Franciscans that of Scotus. Sixtus IV., himself a Franciscan, allowed toleration on this point. In the fifth session of the Council of Trent it was resolved that the doctrine of the conception of all men in original sin was not intended to include the Virgin. The controversy was revived in the University of Paris towards the close of the sixteenth century. During the times of Paul V. and Gregory XV., such was the dissension in Spain that both Philip and his successor sent special embassies to Rome, in the vain hope that this contest might be terminated by a bull. The dispute continued to run so high in Spain that, in the military orders of St. James, of the Sword, of Calatrava, and of Alcantara, the knights, on their admission, vowed to maintain the doctrine. In 1708 Clement XI. appointed a festival to be celebrated throughout the church in honour of the immaculate conception. Since that time it was received in the Roman Church as an opinion, but not as an article of faith until the year 1855, when the pope issued a bull entitled Ineffabilis Deus, which, so far as its authority extends, makes the immaculate conception a point of faith. This belief is also held by the Greek Church, which celebrates the feast under the title of the 'Conception of St. Anne.'

CONCERTINA, a musical instrument invented by Professor Wheatstone. It is generally polygonal in shape, is held between the hands so that the fingers drop naturally down on studs which raise the valves, and allow the air (supplied by the bellows between the finger boards) to act upon a series of metal tongues of the same construction as those of the accordion or harmonium. The usual range of the instrument is from the lowest G on the violin to the C three and a half octaves higher; including the chromatic tones. The German concertina is a much less perfect instrument, as only tunes on a limited number of keys can be performed on it.

CONCERTO, a kind of composition first introduced by the Italian musicians of the seventeenth century, for the purpose of showing the capabilities of the violin, or of a particular performer on that instrument. The principal composers and artistes in this department are Corelli, Viotti, Rodes, Baillot, Kreutzer, Alard, Beriot, and Vieuxtemps. Subsequently concerti were written for other instruments, such as the flute, the piano, &c. Among the most successful composers for the last-mentioned instrument are Bach, Mozart, Hummel, Chopin, Schumann, Ries, Czerny, Thalberg, &c. Concerti usually consist of three movements, an *allegro*, an *andante* or *adagio*, and a lively *rondo*. Except in the *tutti* the orchestra should be as subservient to the instrument for which the piece is written as it should to a vocalist.

Concerto grosso is an expression applied to the great or grand chorus of the concert, or to those places of the concert in which the *ripienos* and every auxiliary instrument are brought into action, for the sake of contrast and to increase the effect.

Concerto spirituale was a concert at Paris, performed in the religious seasons, when the theatres were closed. The pieces performed, however, were not always of a spiritual kind. It was introduced in 1725 by Anne Danican, called *Philidor*.

CONCERT PITCH, the pitch of a certain note in the musical scale adhered to by the general body of musicians. The middle C (seated on the ledger-line which unites the G and F clefs) is produced by a string making, according to theorists, 512 vibrations per second. In England, however, the pitch has risen to 538, while in Germany it is 528, and in France 522. The gradual rise of the pitch from the theoretical 512 vibrations is attributed to the necessities of pianoforte tuning on the one hand, and the desire to attain a more intense and brilliant tone on the other.

CONCHOLOGY, or more correctly CONCHYLIOLOGY, no longer holds the place it formerly occupied in science. The greater ease of obtaining the shells than the animal which inhabited them, and the more obvious differences between the shells than between the animals, coupled with the elegance of the study as a recreation, have always made the collection of shells popular, and the arrangement of cabinets has led to the writing of systematic treatises. The whole tendency of modern zoology, however, is to subordinate single characters, especially those derived from the exterior, to the sum of characters drawn from the anatomy and the development of animals. Conchology is now, therefore, the technical business of the museum custodier, its place in science being taken by the classification of the Mollusca. As an example of the consequence of exclusive attention to a single character, the conchologists used to include along with the shells of molluscs those of the cirripeds, the animals of which are in reality crustaceans; and the brachiopods or lamp-shells, which they thus arbitrarily separated from the ascidians, their nearest allies.

CONCLAVE (*a room*), the place where the cardinals assemble for the election of the pope; also the electoral assembly of the cardinals themselves. Pope Gregory X., whose election had been delayed for three years, established in the council at Lyons (1274) the regulations of the conclave. It was settled that if the pope should die in a city where he had resided with his court, the cardinals present should not be obliged to wait longer than ten days for their absent brethren. After the lapse of ten days all the cardinals present should assemble in the palace in which the pope had died. Here they were all to be shut up in one room (*conclave*), without partitions or curtains, which, with the exception of one outlet, was to be closed on all sides, so that no one should speak with them, nor be admitted into their presence, except those who were called, with the consent of all the brethren, for the purpose of assisting, in some way, in the election. No one was to be permitted either to send in a messenger, or to write to the cardinals; but a window was to be left open in the room, through which the necessary food could be handed to them. If, in three days after entering the conclave, they had not chosen a pope, they were on the five following days to receive but one dish at noon and in the evening; and after this nothing but bread, wine, and water, till the election should take place. These regulations of Gregory X. have been

observed in their essential provisions in recent times, though not always in every particular. As most of the popes have died in Rome, the conclave has usually been held in the Vatican, in the galleries of which as many cells are built in a row as there are cardinals to be present. There the cardinals repair, two by two, the day after the funeral of the pope, or on the tenth day after his death, after having heard a mass, which is called *Missa Spiritus sancti*, and remain till the election is finished. The conclave which chose Pope Pius VII. was held at Venice by the assembled cardinals, as Pius VI. died far from Rome.

CONCLAVIST, the companion, either lay or clerical, whom the cardinal is allowed to take with him into the conclave during the election of a pope, or to send for if he should fall sick. The conclavists are, in this case, subject to the same laws as the cardinals; they are not permitted to leave the conclave except in a case of severe sickness; they have a common table with the cardinals, and have a cell of the same size. The place of conclavist is honourable, and keenly aspired to. The conclavist of the cardinal who is chosen pope seldom fails to make his fortune. As every cardinal generally becomes a member of the committee of regency, consisting of three cardinals, who are changed daily, each of the conclavists of the cardinals thus engaged has an opportunity to display his talents before the cardinal and his colleagues, as secretary of the committee.

CONCORD (also called *accord*, from the Italian *accordare*, and this from the Latin *chorda*, or from *cor, cordis*, the heart), an expression used in music. It denotes the combination of two or more sounds pleasing to the ear. Concords are the eighth (or octave), the fifth, third, and sixth. Their ratios are 2:1, 3:2, 5:4, 5:3. The two first are called *perfect*, because as concords they are not liable to any alteration by sharps or flats. The two last are called *imperfect*, as being alterable. The fourth is considered as a discord by some authorities; as a component part of an inversion of the perfect chord it may be classed among the concords. See COUNTERPOINT.

CONCORD, several places North America, particularly a town United States, capital of New Hampshire, on both sides of the Merrimack, 63 miles N.N.W. Boston. It consists chiefly of two parts, one on each bank of the river, which is here crossed by two bridges, nearly 2 miles apart. It contains several commodious and handsome churches, and a state-house and state-prison of hewn granite. By means of Concord River, the Middlesex Canal, and a railway, it communicates with Boston, the centre of its extensive trade. It has long been famed for the manufacture of carriages, and it has also manufactures of hardware, cutlery, woollen fabrics, and paper. There are, besides, fulling, and several grist and saw mills, tanneries, potteries, &c. Pop. in 1870, 12,241.

CONCORD, FORMULA OF (*formula concordiæ*), one of the most important doctrinal books of the Protestant Church, composed at the command of Augustus, elector of Saxony, by several distinguished theologians. Augustus had long suspected the existence of secret adherents to the doctrine of Calvin; and being confirmed in this suspicion by investigation, he thought a book of concord, that is, of union, which should definitively settle the form of doctrine to be received, would be the best means for terminating the religious troubles. The theologians engaged upon it met first in a monastery at Torgau, where they prepared a confession of faith on the basis of the older formulas, which they called the Book of Torgau; but when assent was refused to it by foreign states, the theologians met again in the monastery of Bergen, where they revised the Book of Torgau. This revision, made in 1577, was called the Formula of Concord, and received the adhesion of two electorates, twenty duchies, twenty-four counties, and thirty-five imperial cities, some of which, however, repudiated it shortly after. It was rejected in Hesse, Anhalt, Pomerania, Denmark, Sweden, and other countries. It was originally written in German in twelve articles, and was afterwards translated by Osiander into Latin.

CONCORD, GODDESS OF. See CONCORDIA.

CONCORDANCE, a name given especially to a book containing the principal words in the Holy Scriptures, in alphabetical order, with a designation of the places in which they are to be found, but also applied to similar indexes to other works. There are concordances of subjects and of words; and for both kinds either the Greek or Hebrew text, or a universally received translation, may serve as a basis. Works of this kind are useful for the exegetical theologian, because the comparison of parallel passages is one of the most important auxiliaries of exegesis; and not less so for the preacher, because they enable him to examine at once all the passages of Scripture which treat of the same subject. The first work of this kind was published by Hugo Sancto Caro, who used the universally-received Latin translation of the Bible called the *Vulgate*. Some of the most approved concordances in English are those of Cruden, Butterworth, Brown, and Taylor. Of non-biblical concordances, that of Mary Cowden Clarke to Shakspeare (London, 1845) deserves especially to be mentioned.

CONCORDAT, a convention between the Bishop of Rome, as head of the church, and any secular government, for the settling of ecclesiastical relations. One of the most important of the earlier concordats is that of Worms, called also the *Calixtine Concordat*, made in 1122, between Pope Calixtus II. and the Emperor Henry V., in order to put an end to the long contest on the subject of investiture, and which has since been considered a fundamental ordinance in respect to the relations between the Catholic Church and the government in Germany. Most of the concordats have been extorted from the popes by the different nations or governments. This was done as early as the fifteenth century; for, when the Council of Constance urged a reformation of the Papal court, Martin V. saw himself obliged, on the 2d of May, 1418, to conclude concordats with the Germans, and on the 12th of July in the same year also with the English. The popes, however, succeeded, even in the fifteenth and sixteenth centuries, in concluding concordats for their advantage. This was the case with the concordats of Aschaffenburg. That also which was concluded between Leo X. and Francis I. of France (1516) was chiefly to the advantage of the pope. In later times, in particular towards the end of the eighteenth century, the Papal court could not any longer maintain a struggle with the spirit of the times and with the secular powers, and was obliged to resign many privileges by concordats. Bonaparte, when first consul of the French Republic, concluded a concordat with Pope Pius VII., July 15, 1801, which came into operation in April, 1802. It re-established the Catholic Church in France, and has become the basis of the present ecclesiastical constitution of that country. The government obtained by it the right to appoint the clergy; the public treasury gained by the diminution of the large number of metropolitan and episcopal sees to sixty; the pope was obliged to give up the plan of restoring the spiritual orders, and the influence which he exercised by means of delegates, but retained the right of the

canonical investiture of bishops and the revenues connected with this right. The interests of religion suffered by this compact, inasmuch as most of the dioceses became now too large to be properly administered; and the lower clergy, the very soul of the church, who were in a poor condition before, were made entirely dependent on the government. Louis XVIII. concluded at Rome, with Pius VII. (July 11, 1817), a new concordat by which that of 1516, so injurious to the liberties of the Gallican Church, was again revived; the concordat of 1801 and the *articles organiques* of 1802 were abolished; the nation subjected to an enormous tax by the demand of endowments for forty-two new metropolitan and episcopal sees, with their chapters and seminaries; and free scope afforded to the intolerance of the Roman court by the indefinite language of article ten, which speaks of measures against the prevailing obstacles to religion and the laws of the church. This revival of old abuses, this provision for the luxury of numerous clerical dignitaries at the expense of the nation, could please only the ultra-royalist nobility, who saw in it means for providing their sons with benefices. The nation received the concordat with almost universal disapprobation; voices of the greatest weight were raised against it; and the new ministers saw themselves obliged to withdraw their proposition. In the concordat concluded with Bavaria, June 5, 1817, two archbishoprics were established—Munich (with the bishoprics of Augsburg, Passau, and Ratisbon) and Bamberg (with the bishoprics of Würzburg, Eichstädt, and Spires). Seminaries, moreover, were instituted and provided with lands; the nominations were left to the king, with the reservation of the Papal right of confirmation; the limits of civil and ecclesiastical jurisdiction were precisely settled, and the erection of new monasteries was promised. This concordat was published in May, 1818, together with the new political constitution, by which all apprehensions for the Protestant Church in Bavaria were allayed. The treaties concluded by the pope with Prussia in 1821, with Hanover in 1824, and with Würtemberg, Baden, Hesse-Cassel, Hesse-Darmstadt, Nassau, and Frankfort, together, in 1827, were not regular concordats. On the 16th of March, 1851, a concordat was concluded with Spain which consecrated the Roman Catholic religion as the dominant religion in Spain, to the exclusion of every other form of worship. This remained in force as long as Queen Isabella II. held the throne, but after the revolution of 1868 the constituent assembly which met in the following year set it aside, and religious toleration was declared to be the law of the new constitution, which was proclaimed on the 6th of June, 1869. On the 18th of August, 1855, a concordat was concluded with Austria which gave the pope immense power in that empire; but by the three laws passed in 1868, it was rendered of no effect, and in 1870 it was formally abrogated. Before the establishment of Italian unity the ecclesiastical affairs of the different Italian states were regulated by separate concordats. That of Sardinia dated from 1770, that of Naples from 1818. These and all the other concordats concluded with Italian states were abolished on the occasion of the erection of the Kingdom of Italy.

CONCORDIA, or CONCORD, personified and worshipped as a goddess in Rome, where she had several temples, the most important of which was that in the capitol, erected by Camillus. An annual feast was celebrated in her honour, the 16th of January. She was represented with wreaths of flowers on her head, and in one hand a cornucopia, in the other an olive branch or a *patera*.

CONCRETE, a technical word in logic. If we conceive of certain qualities as existing in an object, we then regard them, according to philosophical language, *in concreto*, or in the concrete; but if we think of them separately from the object, we then regard them *in abstracto*, or in the abstract; for example, *a just man* is a concrete conception, but *justice* is an abstract idea.

CONCRETE, a composition used in building, consisting of hydraulic or other mortar mixed with gravel or stone chippings about the size of a nut. The best method of making it is to add the gravel to the mortar, which has previously been prepared in the ordinary way, and then turn them over together frequently until they are thoroughly mixed. The mixture is then tightly rammed down into the trench or mould which is to receive it. It is used very extensively in building under water, for example, to form the bottom of a canal or sluice, or the foundations of any structure raised in the sea. In moist districts it is also frequently used to make a bed for asphalt pavements, or to form a basis of artificial stone for buildings of any kind. It is sometimes even used as the material with which the walls of houses are built, the concrete being firmly rammed into iron moulds of the requisite shape. The fact that concrete is inferior in appearance to stone is against its being generally used in structures above ground, but it lasts longer than stone, and more effectually resists damp.

CONCRETIONS, MORBID, in animal economy, hard substances that occasionally make their appearance in different parts of the body, as well in the solids as in those cavities destined to contain fluids; in the former case they are denominated *concretions* or *ossifications;* in the latter, *calculi*. The concretions are named from the parts of the body in which they occur. *Pineal* concretions, from their being found in that part of the brain called the *pineal gland*, consist of carbonate and phosphate of calcium with organic matter; *salivary* concretions, as being discovered occasionally in the salivary glands, also consist mainly of earthy phosphates; *pancreatic* concretions are hard substances found in the pancreas; *pulmonary* concretions, which have been sometimes coughed up by consumptive persons, contain mucus and albumen in addition to the salts; *hepatic* concretions, of which the liver is sometimes full, are composed chiefly of cholesterin, mucus, and colouring matter; *urinary* concretions are found in the bladder, and their constituents are very variable, uric acid, urates, fibrin, oxalates, phosphates, and several other bodies being found. *Gouty* concretions consist of urate of sodium and small quantities of other salts with organic matter. Concretions have been discovered in the intestines and stomach of man, but more frequently in the bodies of other animals. Those found in the intestines of a horse were examined by Fourcroy, and found to consist of magnesia, phosphoric acid, ammonia, water, and animal matter. See CALCULI.

CONCUBINAGE, the cohabitation of a man with a concubine. Among the Greeks concubinage was allowed even to married men: the number of their concubines, also, was unlimited. Among the Romans concubinage was neither unlawful nor disgraceful. It was, moreover, formally permitted to unmarried men by the Lex Julia, and by the Lex Papia Poppæa, but with the provision that it should be limited to a single concubine, and that only women of mean descent, as freed women, actresses, and the like, should be chosen for the purpose. The children begotten in concubinage were not considered as legitimate, but were called *natural*, and the right of inheritance of the concubine and her children was very much limited. With the introduction of Christianity concubinage ceased; and, indeed, Constantine the

Great made laws against it. The Code Napoléon did not expressly forbid concubinage, but the lawful wife could sue for a divorce (since the restor tion of the Bourbons, only for separation), in case of the introduction of a concubine by her husband into their common residence.

CONCURRENT JURISDICTION, the jurisdiction of different courts authorized to take cognizance of the same case. In criminal cases the court which first takes up a case has what is called the right of prevention, that is, the right of deciding upon that case exclusive of the other courts, which but for that right would have been equally entitled to take cognizance of it. In civil cases it lies with the suitor to bring his cause before any court he pleases, which is competent to take it up. Concurrent, also called cumulative, jurisdiction is opposed to privative jurisdiction.

CONCUSSION SHELL, a shell that explodes by a percussion arrangement on striking the object.

CONDAMINE, CHARLES MARIE DE LA. See LA CONDAMINE.

CONDÉ, a town of France, department Nord, 7 miles N.N.E. of Valenciennes, at the confluence of the Hayne and Scheldt. It is well built, and has a superb arsenal. The fortifications were constructed by Vauban. It has manufactories of starch and chicory, oil and salt refineries, bleaching grounds, nail and rope works, &c. In 1794 it was besieged and taken by the Austrians, retaken by the French after the battle of Fleuries, and again taken by the allies in 1815. Pop. 4642.

CONDÉ, LOUIS DE BOURBON, founder of the house of. See BOURBON.

CONDÉ, LOUIS DE BOURBON, PRINCE OF (the *Great Condé*), born in 1621; a general of distinguished talents, great advantages of person, and very attractive manners. During the life of his father he bore the title of Duc d'Enghien. He immortalized this name at the battle of Rocroi, in which, at the age of twenty-two, he defeated the Spaniards (1643). Wherever he appeared he was victorious. He was so fortunate as to repair the consequences of a defeat of Marshal Turenne. He besieged Dunkirk in sight of the Spanish army, and gained this place for France in 1646. During the troubles of the Fronde he at first took the side of the court against the parliament and the nobles, and after a siege of a few months brought back the young Louis XIV. to Paris (1649); but believing himself to be ill requited by Mazarin for his services, he put himself at the head of the faction of the *Petits Maîtres*. Being captured, however, he was imprisoned by Mazarin (1650), and was not released till after the lapse of a year. He left his confinement burning with the desire of vengeance, and at once put himself at the head of a new Fronde, and entered upon negotiations with Spain. In spite of several checks he then marched upon Paris, where he was met and opposed in the suburb St. Antoine (1652). The battle which ensued was indecisive; and Condé, finding himself abandoned by many of his friends, retired in anger to the Netherlands, and openly joined himself with the Spaniards, who appointed him generalissimo of the Spanish armies. In this capacity he unsuccessfully besieged Arras in 1654; but he was more fortunate at Valenciennes in 1656, and at Cambrai in 1657. In 1658 he was defeated, along with Don John of Austria, before Dunkirk, at the battle of the Dunes, by Turenne, and was only restored to royal favour by the Peace of the Pyrenees in 1659. In 1668 he was charged with the reduction of Franche Comté (then belonging to Spain), which he accomplished in three weeks; and in 1674, at the head of one of the armies sent by Louis XIV. against the United Provinces, he defeated the Prince of Orange (afterwards William III. of England) at Senef. He was unable, however, to take advantage of this victory, as he was obliged to withdraw into Alsace to defend it against Montecuculi, to whom it was thrown open by the death of Turenne in 1675. He succeeded in driving Montecuculi across the Rhine. This was his last triumph. Four years later he retired to Chantilly, near Paris, where he devoted himself to the sciences. He died at Fontainebleau in 1687.

CONDÉ, LOUIS JOSEPH DE BOURBON, PRINCE OF, born at Chantilly in 1736; only son of the Duke of Bourbon and the Princess of Hesse-Rheinfels. In the Seven Years' war he distinguished himself by his courage and skill, and in 1762 gained a victory at Johannisberg over the hereditary Prince of Brunswick. On the outbreak of the revolution in 1789 he emigrated to Brussels, and from thence to Turin. He afterwards formed in 1792, at Worms, a little corps of emigrant nobility, which joined the Austrian army under Wurmser. In 1795 he entered with his corps into the English service. In 1796 he fought in Suabia. In 1797 he entered the Russian service, and marched with his corps to Russia, where he was most hospitably received, and became the guest of Paul I.; he returned in 1799 to the Rhine under Suwaroff. In 1800, after the separation of Russia from the coalition, he re-entered the English service. The campaign of 1800 ended the military career of the prince. He lived in England till 1813, in which year his second wife, the Princess of Monaco, died. He returned to Paris, May 14, 1814; received the 10th Regiment of the line, and the office of colonel-general of infantry, as also that of *Grand Maître de France*, and the protectorate of the order of St. Louis. He attended the celebrated royal council, March 17, 1815; fled with the king to Ghent, and returned with him to Paris in July, where, being appointed president of a bureau of the chamber of peers, he remained some time, but at last retired to Chantilly, where he had formerly written the interesting Essai sur la Vie du Grand Condé, par L. J. de Bourbon, son 4me Descendant, the first edition of which appeared in 1806. He died at Paris in 1818.

CONDENSATION. Besides the mechanical powers (see CONDENSER), there are also chemical means for converting gaseous fluids into liquids by condensation; for example, steam into water by means of cold. Volta gives the name of *condenser of electricity* to an instrument invented by him for collecting and measuring electricity in cases in which it is feebly developed.

CONDENSER, a pneumatic engine or syringe, by which air is compressed into a receiver. See PNEUMATICS.

CONDENSER. See CONDENSING STEAM-ENGINE.

CONDENSING STEAM-ENGINE, the name given to the steam-engine invented by Watt, in which the steam, after pushing the piston up or down in the cylinder, is led away by an eduction-pipe to be condensed in a separate vessel, instead of being condensed by a jet of water introduced into the cylinder itself, as in the old atmospheric-engine of Newcomen. The old plan was shown by Watt to be wasteful, since for the down-stroke of the piston not only had the steam in the cylinder to be condensed, but the cylinder itself had to be reduced from a temperature of 212° to about 100° Fahr., otherwise steam was produced, which greatly hindered the action of the piston; while for the up-stroke the cylinder had not only to be filled with steam, but to be raised again to 212° Fahr. It was to remedy these defects that Watt introduced his separate condenser. There are single-acting and double-acting condensing steam-engines. The former were the

first kind that were used, since steam-power was at first applied only to pump water, which is almost the only purpose to which this form of the condensing steam-engine can be applied. When it is so used the weight of the pumping-rods is sufficient to make the piston ascend in the cylinder; and all that the steam is required to do is to force the piston down. For this purpose the steam is introduced by a valve in the top of the cylinder; and when the piston is forced down to the bottom of the cylinder the steam-valve is shut, and another valve called the equilibrium-valve is opened, which allows the upper part of the cylinder to communicate freely with the lower part, so that the steam which has been introduced into the upper part finds its way to the lower part also. The piston is thus acted on by an equal pressure above and below, and there is now no hindrance to its ascent; and as the weight of the pumping-rods is sufficient to effect this, the piston rises again to the top of the cylinder, and is ready for another stroke. The equilibrium-valve is now closed, so that the steam is confined to the lower part of the cylinder, which is now brought into communication with the condenser by means of the eduction-pipe. The consequence is that it is immediately condensed; and a vacuum being formed underneath the piston, there is no resistance offered to its next stroke, which is made as before. In the double-acting condensing steam-engine the steam is required to cause both the ascent and the descent of the piston. In it four valves are necessary—two connecting the cylinder with the steam-box, one at the upper and the other at the lower end, and two connecting it in the same way with the eduction-pipe which leads the steam after performing the work to the condenser. When the piston is at the top of the cylinder the upper steam-valve and the lower exhausting-valve are open; the other two are closed. There is thus a vacuum produced by the condensation of the steam under the piston, while at the same time steam is introduced above the piston, which forces it down. When the piston reaches the bottom of the cylinder the lower steam-valve and the upper exhausting-valve are open, while the other two are closed; and consequently the upper part of the cylinder is now brought into connection with the condenser, so that a vacuum is now produced above the piston, while the steam introduced by the valve below it forces it up. The name of *non-condensing steam-engine* is given to those steam-engines in which the steam, after doing its work, is not led into a condenser, but is merely allowed to escape into the atmosphere, as is the case with all locomotive-engines, in which the steam always escapes by the funnel. See STEAM-ENGINE.

CONDESCENDENCE, one of the written pleadings in a process before the Court of Session and sheriff-courts in Scotland. Formerly a condescendence was necessary only when the parties to an action did not agree about the facts of a case as set forth in the summons and defences, or when the lord-ordinary required it. Since the passing of the Court of Session act of 1850 the summons contains nothing more than the name and designation of the pursuer and defender, and a statement of the conclusions of the action; and the pursuer is required to set forth in an articulate condescendence the grounds of the action, and all facts and circumstances connected with it, along with a note of the pleas in law on which the pursuer founds. The condescendence is annexed to the summons, and is regarded as constituting part of it. The defender is required to put his defence in the form of articulate answers to the condescendence; and he may add, if necessary, a statement of his allegations in fact, along with a note of pleas in law.

CONDÉ-SUR-NOIREAU, a town, France, department Calvados, at the confluence of the Noireau and Drouance, with 6643 inhabitants. It is supposed to be of Roman origin, and has two old churches with some fine stained glass. It was one of the first towns in France which embraced the Reformation.

CONDILLAC, ÉTIENNE BONNOT DE, among the French the founder of the sensual system of philosophy, was born in 1715, at Grenoble, and was like his brother, the Abbé Mably, devoted to study from his youth. His Essai sur l'Origine des Connaissances Humaines (1746, two volumes) first drew the attention of the world to a thinker, who, with much acuteness of mind, sought to explain by the law of the association of ideas almost all the phenomena of the human mind. Although Locke's discoveries in the department of psychology, founded upon experience, might have had an influence on this work, yet no one can deny to Condillac the merit of having made more profound inquiries on many points. He himself, however, thought that he had not sufficiently explained the first principles of the faculties of the human mind, and therefore wrote the Traité des Systèmes (1749, two volumes), in which he frequently referred to more accurate observations. Any one would misunderstand Condillac who should believe that he disapproved of all systems; but instead of those maxims and theories which Descartes, Spinoza, Malebranche, &c., had laid down as the basis of their speculations, he demanded observations of the simplest kind. His Traité des Sensations (1754, two volumes) is interesting for the ingenious manner in which he has explained the consciousness of impressions on the senses. Mortified by the supposition that he had followed the course of ideas in Diderot's and Buffon's works, he wrote his Traité des Animaux (1755), in which he refuted Buffon's opinions by principles which he had advanced in his Traité des Sensations. The sagacity and the clearness which distinguish all Condillac's writings obtained for him the distinction of being chosen instructor of the infant Duke of Parma, nephew of Louis XV. For his pupil he wrote his acute work, the Cours d'Etudes (1755, thirteen volumes), which comprehends a grammar, an Art d'écrire, an Art de raisonner, an Art de penser, and a general history. Condillac returned, after the completion of the education of the young prince, to Paris, where, in 1768, he was admitted into the French Academy, which, however, he did not visit again after the day of his entrance. His work, Le Commerce et le Gouvernement Considérés Relativement l'un à l'autre (1776), which is an application of his analytical method to several problems in the administration of the state, met, however, with little approbation. His Logic, the last of his works published during his lifetime, he wrote by request, in 1780, as a manual for the Polish schools. The tracing back of the thoughts to their simplest beginnings, as the most certain means of finding the truth, is urgently enjoined by him. Condillac died at his estate of Flux, near Beaugency, Aug. 3, 1780. His Langue des Calculs first appeared in 1798. The collection of his works, the revision of which he had begun, appeared in 1798, in twenty-three volumes, and again the same year, in thirty-five volumes; another edition, in sixteen volumes, appeared in 1821–22. See FRENCH PHILOSOPHY.

CONDITIONED, PHILOSOPHY OF THE, or PHILOSOPHY OF THE UNCONDITIONED, the name given by Sir William Hamilton to certain philosophical views first promulgated by him in an article contributed to the Edinburgh Review, in October, 1829, forming a critique on Victor Cousin's philosophy, especially of his doctrine of an absolute cause. The Unconditioned is regarded by Sir William Hamilton

as a genus including two species: the Infinite, or the unconditionally unlimited, and the Absolute, or the unconditionally limited; and the thesis which he maintains and expounds in the essay referred to, and which forms one of the leading doctrines of his philosophical system, is that the Unconditioned, as thus explained, is entirely unthinkable. In his own words, 'the mind can conceive, and consequently can know only the *limited, and the conditionally limited.* . . . Conditional limitation is the fundamental law of the possibility of thought.' This he illustrates by stating that we can neither conceive an absolute whole, that is, a whole so great that we cannot conceive it also as a part of a still greater whole; nor an absolute part, that is, a part so small that we cannot conceive it as a relative whole, divisible into still smaller parts. And this he declares to hold good as to space, time, and degree. 'The Conditioned,' he goes on to say, 'is the mean between two extremes—two unconditionates, exclusive of each other, *neither of which can be conceived as possible*, but of which, on the principles of contradiction and excluded middle, *one must be admitted as necessary.*' The Unconditioned, on the other hand, being merely negations of the Conditioned in its opposite extremes, bound together by the aid of language and their common character of incomprehensibility, is not even a notion, either simple or positive. It presents no object to the thought, and can afford no real knowledge. From this, however, we are only to learn that our faculties are weak, and that hence we have no right to constitute our capacity of thought into the measure of existence. Although then we are unable to conceive anything above the relative and finite, it is quite competent to us to believe in the existence of something unconditioned beyond the sphere of all that is conceivable by us. This doctrine was adopted by Mansel, dean of St. Paul's, and applied by him to determine the limits of religious thought. It was combated by John Stuart Mill. [See the article above-mentioned, which was republished in Sir William Hamilton's Discussions (2d ed. 1853); Mansel's Limits of Religious Thought (1858); and Philosophy of the Conditioned (1866); and Mill's Examination of Sir W. Hamilton's Philosophy (3d ed. 1867.)]

CONDOM, a town, France, in the department Gers, 25 miles N.N.W. of Auch, agreeably situated on a height, at the foot of which flows the Baise, here crossed by two stone bridges. It is for the most part old and ill built, but is adorned in the neighbourhood by handsome villas. In its centre is a large square, containing the parish church, formerly the cathedral, a noble Gothic edifice, but dilapidated. It has manufactures of quills, corks, porcelain, woollen yarn, leather, and brandy. A considerable trade is carried on in grain, flour, wine, and brandy. Condom was formerly the capital of an extensive district called the Pays-de-Condomois. Bossuet was for some time its bishop. Pop. 8140.

CONDONATION, in English and Scotch law, a forgiveness of injury, such as to restore the person who has committed an offence to the same position which he or she held before it was committed. In an action on the ground of adultery it is a legal plea in defence.

CONDOR. The popular name of the great vulture of the Andes, formed by a mispronunciation of the Indian name *kunter*, which, according to Humboldt, is derived from another word in the language of the Incas, signifying *to smell well*. This species (*Vultur gryphus*, Linn., or *Sarcoramphus gryphus*) belongs to the cathartide family of diurnal rapacious birds, and which is distinguished by the following characters:—The bill is elongated and straight at base; the upper mandible is covered to the middle by the cere; the nostrils are medial, approximate, oval pervious, and naked; the tongue is canaliculate, with serrated edges; the head is elongated, depressed, and rugous; the tarsus rather slender; the lateral toes equal; the middle toe is much the longest, the inner free, and the hind one shortest; the first primary is rather short, the third and fourth are longest.

The natural history of the condor was in a fair way to rival the ancient fables of griffins, basilisks, and dragons, or even of exceeding the roc of Sinbad the Sailor, in extravagant exaggeration, until Humboldt placed it upon the basis of truth. His careful measurements established the fact that the wonderfully gigantic condor is not generally larger than the lämmergeyer, or bearded vulture of the Alps, which it closely resembles in various points of character. These birds prefer to dwell above all animal life, and at the extreme limit of even Alpine vegetation, inhaling an air too highly rarefied to be endured, unless by creatures expressly adapted thereto. From such immense elevations they soar upwards into the dark blue heavens, until their great bulk diminishes to a scarcely perceptible speck, or is lost to the aching sight of the observer. In these pure fields of ether, unvisited even by the thunder-cloud—regions which may be regarded as his own exclusive domain—the condor delights to sail, and with piercing glance surveys the surface of the earth, towards which he never stoops his wing unless at the call of hunger. But although the condor is a lover of the clearest and purest air, it must be confessed that he is a carrion bird, and is quickly lured to the plains by the sight or scent of a carcass, especially of a sheep or ox. To such a feast considerable numbers repair, and commence their filthy banquet by first plucking out the eyes, and then tearing away the tongue of the animal, their favourite delicacies; next to these the bowels are the morsels most eagerly sought for, and devoured with that greedy gluttony which distinguishes the whole vulture tribe. The appetite of these birds seems to be limited only by the quantity of food that can be gorged into their stomachs; and when thus overloaded they appear sluggish, oppressed, and unable to raise themselves into the air. The Indians profit by this condition to revenge themselves on the condors for the many robberies which they commit upon their flocks, and watching while they eat, until flight has become exceedingly difficult, attack and secure them by nooses, or knock them down with poles before they can get out of the way. If the condor, thus loaded, succeeds in rising a short distance from the ground, he makes a violent effort, kicking his feet towards his throat, and relieves himself by vomiting, when he soon ascends out of reach. Many, however, are surprised, and captured or killed before they are able to ascend. But the condor does not exclusively feed upon dead or putrefying flesh; he attacks and destroys deer, vicuñas, and other middling-sized or small quadrupeds; and when pinched by hunger a pair of these birds will attack a bullock, and by repeated wounds with their beaks and claws harass him until, from fatigue, he thrusts out his tongue, which they immediately seize and tear from his head; they also pluck out the eyes of the poor beast, which, if not speedily rescued, must soon fall a prey to their voracity. It is said to be very common to see the cattle of the Indians on the Andes suffering from the severe wounds inflicted by these rapacious birds. It does not appear that they have ever attacked man. When Humboldt, accompanied by his friend Bonpland, was collecting plants near the limits of perpetual snow, they were daily in company with several condors, which would suffer themselves to be quite closely approached without ex-

hibiting signs of alarm, though they never showed any disposition to act offensively. The condor is not known to build a nest, but is said to deposit its eggs on the naked rocks. The eggs are reported to be altogether white, and 3 or 4 inches long. When hatched the female is said to remain with the young for a whole year in order to provide them with food and to teach them to supply themselves. In relation to all these points satisfactory information still remains to be desired. We have seen that hunger impels the condors to descend to the plains, and it is also true that they are occasionally seen even on the shores of the southern ocean, in the cold and temperate regions of Chili, where the Andes so closely approach the shores of the Pacific. Their sojourn, however, in such situations is but for a short time, as they seem to require a much cooler and more highly rarefied air, and prefer those lofty solitudes where the barometer does not rise higher than 16°. When they descend to the plains they alight on the ground rather than upon trees or other projections, as the straightness of their toes renders the first-mentioned situation most eligible. Humboldt saw the condor only in New Granada, Quito, and Peru, but was informed that it follows the chain of the Andes from the equator to the seventh degree of north latitude into the province of Antioquia. There is now no doubt of its appearing even in Mexico and the south-western territory of the United States.

The head of the male condor is furnished with a sort of cartilaginous crest, of an oblong figure, wrinkled, and quite slender, resting upon the forehead and hinder part of the beak for about a fourth of its length; at the base of the bill it is free. The female is destitute of this crest. The skin of the head in the male forms folds behind the eye, which descend towards the neck, and terminate in a flabby, dilatable or erectile membrane. The structure of the crest is altogether peculiar, bearing very little resemblance to the cock's comb or the wattles of a turkey. The auricular orifice is of considerable size, but concealed by folds of the temporal membrane. The eye, which is peculiarly elongated, and farther distant from the beak than the eagle's, is of a purple hue, and very brilliant. The neck is uniformly marked by parallel longitudinal wrinkles, though the membrane is not so flabby as that covering the throat, which appear to be caused by the frequent habit of drawing the neck downwards to conceal or warm it within the collar or hood. The collar in both sexes is a fine silken down, forming a white band between the naked part of the neck and beginning of the true feathers, and is rather more than 2 inches broad, not entirely surrounding the neck, but leaving a very narrow naked space in front. The rest of the surface, the back, wings, and tail, are of a slightly grayish-black, though sometimes they are brilliantly black; the feathers are triangular, and placed over each other tile-wise. Humboldt never saw male condors with white backs, though descriptions of such have been given by Molina and others. The primaries are black; the secondaries in both sexes are exteriorly edged with white. The wing-coverts, however, offer the best distinction of the sexes, being grayish-black in the female, while in the male their tips, and even half of the shafts, are white, so that his wings are ornamented with beautiful white spots. The tail is blackish, wedge-shaped, rather short, and contains twelve feathers. The feet are very robust, and of an ashen blue colour, marked with white wrinkles. The claws are blackish, very long, and but slightly hooked. The four toes are united by an obvious but delicate membrane; the fourth is the smallest, and has the most crooked claw. The largest male condor described by Humboldt was 3 feet 3 inches long from the tip of the beak to the tip of the tail; height, when perched, with the neck moderately extended, 2 feet 8 inches; from the tip of one extended wing to the tip of the other, 8 feet 9 inches. Humboldt states that he never saw a condor which measured more than 9 feet across the wings; but a specimen described by Dr. Shaw measured 14 English feet. Notwithstanding, therefore, what is said by Humboldt of the general correspondence in size of the Alpine lämmergeyer and the condor of the Andes, we cannot avoid believing that a full-grown individual of the latter species would be much more than a match in every respect for any European species. The condor is peculiarly tenacious of life, and has been observed, after having been hung for a considerable time by the neck in a noose, to rise and walk away quickly when taken down for dead, and to receive several pistol bullets in its body without appearing greatly injured. The great size and strength of its plumage defends its body to a considerable degree from the effects of shot. It is easily killed when shot, or struck sufficiently hard, about the head.

CONDORCET, Marie Jean Antoine Nicolas de Caritat, Marquis de, an eminent French writer, was born September 17, 1743, at Ribemont, near St. Quentin, of one of the oldest families in Dauphiné. At the age of twenty-one he presented to the Academy of Sciences an Essai sur le Calcul Intégral. His Memoire sur le Problème des Trois Points appeared in 1767. Both works were afterwards united under the title of Essais d'Analyse. The merit of this work gained for him in 1769 the distinction of a seat in the Academy of Sciences. With astonishing facility and versatility Condorcet treated the most difficult problems in mathematics; but his genius inclined him rather to lay down beautiful formulas than to pursue them to useful applications. Condorcet also wrote Éloges des Académiciens morts avant 1699 (Paris, 1773), which were received with so much applause that he was appointed perpetual secretary to the Academy. In 1777 his Theory of Comets gained the prize offered by the Academy of Berlin, and he enriched the Transactions of the learned societies of St. Petersburg, Berlin, Bologna, Turin, and Paris with profound contributions in the department of the higher mathematics. The aversion of the minister Maurepas to Condorcet delayed his entrance into the French Academy till 1782. Being intimately connected with Turgot, he was led into a thorough examination of the system of the economists, and his acquaintance with D'Alembert made him take an active part in the Encyclopédie, for which he wrote many articles. During the troubles of the first French revolution his sympathies were strongly engaged on the side of the people. On the intelligence of the flight of King Louis XVI. he represented in a speech which was highly admired, the royal dignity as an anti-social institution. By the city of Paris he was elected deputy to the legislative assembly, of which he was soon appointed secretary, and shortly after (February, 1792) president. In the national convention, in which the legislative assembly was merged, September 20, 1792, he voted for the most part with the Girondists. On the trial of Louis he was in favour of the severest sentence not capital; at the same time he proposed to abolish capital punishments, except in case of crimes against the state. This participation in the proceedings against the king was the reason why his name was struck off from the list of members of the Academies of St. Petersburg and Berlin. The fall of the Girondist party, May 31, 1793, prevented the constitution which Condorcet had drawn up from being accepted. The constitution then adopted he attacked without

moderation or reserve, and was, in consequence, denounced at the bar, July 8. He was accused, October 3, of being an accomplice of Brissot. To save his life he concealed himself, and was declared out of the protection of the law. Madame Verney, a woman of noble feelings, secreted him for eight months. She procured him the means of subsistence, and even wrote little poems to enliven his spirits. While in this retreat, without the assistance of others, and surrounded by all the horrors of his situation, Condorcet wrote his curious Esquisse d'un Tableau historique des Progrès de l'Esprit humain, full of enthusiasm for that liberty the perversion of which caused him so much suffering. He at last learned from the public papers that death was denounced against all those who concealed a proscribed individual. In spite of the prayers of the generous woman who had given him refuge he left her, and fled in disguise from Paris. He wandered about for a long time, until, driven by hunger, he entered a small inn at Clamat, where he was arrested as a suspicious person by a member of the revolutionary tribunal of Clamat, and thrown into prison to undergo a more strict examination. On the following morning, March 28, 1794, he was found dead on the floor of his room, apparently having swallowed poison, which he always carried about him, and which nothing but his love for his wife and daughter had prevented him from using before. A collection of his numerous writings, complete with the exception of his mathematical works, appeared in Paris in 1804 (Œuvres complètes, publiées par Garat et Cabanis, twenty-one vols.) Another edition was published at Paris in twelve vols. in 1847–49.

CONDOTTIERI (*leaders*), the captains of those bands of soldiers which were frequent in Italy towards the end of the middle ages, who sought for service in every war, and fought not for their country but for pay and plunder, and offered their assistance to every party which could pay them. These bands originated in the endless wars and feuds of the Italian states and governments at that time, and the whole military power soon came into their hands. They consisted principally of men too ignorant or too indolent to obtain an honest livelihood, or who wished to escape the punishment of some crime. They included, however, many people who had been deprived of their fortunes by these wars. As these men had not the slightest interest in those who hired them but that of being paid, and of finding opportunities for plunder, wars terminated with very little bloodshed, sometimes with none; for when the bands of condottieri met, the smallest in number not unfrequently surrendered to the other. The most ambitious among them, however, had higher views. Such was Francesco Sforza, who being chosen by the Milanese to command their army, made himself, in 1450, their duke and lord, and whose posterity continued to possess sovereign power. There was little difference between most of the condottieri and some of the nobler kind of robbers.

CONDUCTOR, or LIGHTNING-CONDUCTOR, is an instrument by means of which either the electricity of the clouds, the cause of lightning, is conducted without explosion into the earth, or the lightning itself is received and conducted quietly into the earth or water without injuring buildings, ships, &c. Franklin was the inventor of the lightning-conductor. While making experiments on electricity, he observed that a pointed metallic wire, if brought near an electrified body, gradually deprives the latter of its electricity in such a manner that no sparks appear. He considered, therefore, that electrified clouds might be deprived of their electricity if a pointed metallic rod were fastened upon the highest part of a building, and a wire carried down from this into the earth, so that the electricity of the cloud, discharged by the point, might be conducted into the ground. Franklin's conjecture proved to be well founded, and conductors were soon after introduced into many countries. They at first consisted of an iron rod running down the sides of a building into the earth, while its point rose several feet above the building. The conductor now generally used is a rod of iron an inch thick, to the upper end of which is attached a tapering piece of copper 8 or 9 inches in length, gilded to prevent its corroding. This rod is fixed to the highest part of a building in such a way as to rise at least 5 or 6 feet above it: to this are fastened strips of copper 3 or 4 inches broad, and rivetted together, which must reach to the earth, and be carried deep into it. The strips are to be carefully nailed upon the roof and against the wall of the building. Frequently, however, a massive iron conductor is to be preferred to the copper strips. What is required is a conductor that gives the greatest facility for the escape of the electricity to the earth and is at the same time as inexpensive as possible; and though copper is a much better conductor than iron, still from the cheapness of the latter material it is often advantageous to furnish a sufficiently powerful conductor of very massive iron. The one point to be attended to in the construction of the conductor is to make it so powerful that there shall be no tendency for the electricity to make its way to the earth by leaping from the conductor to the building with which it is connected. This has many times been the cause of accident. Stones wet with a thunder-shower become tolerably good conductors of electricity; and if the charge finds easier passage to the earth by them than by the conductor, it may readily rush to them, and will almost inevitably, in that case, do serious damage. For the same reason, the connection of the conductor with the earth must be as perfect as possible. The conductor should be led deep into the earth: if possible it should be attached to the large water-pipes that supply the building; if not, it ought to be carried down so deep as to be bedded in a well, or in earth that can never become dry, and it may, with great advantage in the latter case, be connected with a large plate of metal buried there. All outlying metal on the roof of the building, masses of lead, for example, should be connected by stout wires, or wire-rope, with the lightning-conductor. The first conductor in England was erected at Paynes-hill, by Dr. Watson, in 1762.

CONDUIT (French), in architecture, a long narrow passage between two walls or underground, for secret communication between various apartments, of which many are to be found in old buildings; also a canal of pipes for the conveyance of water, a sort of subterraneous or concealed aqueduct. The construction of conduits requires science and care. The ancient Romans excelled in them, and formed the lower parts, whereon the water ran, with cement of such an excellent quality that it has become as hard as the stone itself which it was employed to join. There are conduits of Roman aqueducts still remaining, of from 5 to 6 feet in height, and 3 feet in width. Conduits in modern times are generally pipes of wood, lead, iron, or pottery, for conveying the water from the main spring or reservoirs to the different houses and places where it is required.

CONE, geometrical, usually means what mathematicians more strictly call a right circular cone, and which may be defined as the solid figure traced out when a right-angled triangle is made to revolve round one of the sides that contain the right angle. A more comprehensive definition may be given as follows:—Let a straight line be held fixed at one point, and let

any other point of the line be made to describe any closed curve which does not cut itself; the solid figure traced out is a cone. When the curve which the second point describes is a circle, the cone is a right circular cone. The geometry of the cone is important on account of the curves called conic sections, which are obtained by cutting a right circular cone by planes in various directions. (See CONIC SECTIONS.) The cubical content of a right circular cone is one-third of that of a cylinder on the same base and of the same altitude. The cubical content of the cone is therefore found by multiplying the area of the base by the altitude, and taking one-third of the product.

CONEGLIANO, a town in the Kingdom of Italy, in the province of Treviso, situated on a hill slope, 28 miles north of Venice. It is the seat of the district government, has several churches, one of which was destroyed by an earthquake on the 29th of June, 1873, and an hospital, and some manufactures of silk and of woollen cloths. Marshal Moncey derived his ducal title from this town. It is the birth-place of the painter Giambattista Cima da Conegliano. Pop. 6840.

CONFARREATIO. See MARRIAGE.

CONFEDERATION, GERMANIC. See GERMANY.

CONFEDERATION OF THE RHINE. In the war of 1805, which turned out so unfortunately for Austria, several of the princes of the south of Germany were obliged to ally themselves to France, or did it voluntarily. The Peace of Presburg (Dec. 26, 1805) gave the first impulse to the entire dissolution of the German Empire, by conferring crowns on the electors of Bavaria and Würtemberg, and on both, as well as on Baden, complete sovereignty, such as had been already exercised by the other great German states. Soon after (May 28, 1806), the first German elector, arch-chancellor of the empire, announced to the diet that he had appointed Cardinal Fesch, uncle of Napoleon, his coadjutor and successor —an act inconsistent with the constitution of the empire. Ultimately sixteen German princes made a formal declaration of their separation from the emperor and the empire, in the act of confederation signed at Paris, July 12, 1806, by the Kings of Bavaria and Würtemberg, the Elector Arch-chancellor of the empire, the Elector of Baden, the new Duke of Clèves and Berg (Joachim Murat), the Landgrave of Hesse-Darmstadt, the Princes of Nassau-Usingen, Nassau-Weilburg, Hohenzollern-Hechingen, Hohenzollern-Sigmaringen, Salm-Salm, and Salm-Kyrburg, the Duke of Ahremberg, the Princes of Isenburg-Birstein and of Liechtenstein, and the Count of Leyen. This was communicated to the diet Aug. 1, 1806. They assigned as the reason for this separation, the deficiencies of the constitution of the German Empire, and invited the other members of the empire to join their confederation. The French ambassador, Bacher, announced on the same day that his sovereign would no longer acknowledge a German Empire. The titles attached to several of the confederated states were changed, and Napoleon adopted the title of *Protector of the Confederation of the Rhine*. By the establishment of this confederation the following states lost their political independence:—the imperial free city of Nürnberg, which was ceded to Bavaria; Frankfort, to the arch-chancellor (now called the prince-primate); the principality of Heitersheim, belonging to the order of the knights of St. John, which became subject to Baden; and the burggravate of Friedberg, to Hesse-Darmstadt. Furthermore, by mediatization, the Princes of Nassau and Orange-Fulda, of Hohenlohe, Schwarzenberg, and many others; the Landgrave of Hesse-Homburg, the Dukes of Looz-Corswarem and of Croy, many counts of the empire, and all the former knights of the empire, were subjected to the princes of the Confederation of the Rhine. These mediatized members of the empire only kept possession of their patrimonial estates and private property, the jurisdiction in the first and second instances, the feudal rights, and mining privileges, &c.; but the power of legislation, essential to sovereignty, the supreme jurisdiction, the right of declaring war and peace, of forming alliances, of regulating the police and taxation, &c., devolved on the princes of the confederation, to whom these mediatized princes became subject. Sept. 25, 1806, the Elector of Würtzburg joined the confederacy as a grand-duke, and likewise the Elector of Saxony, after having separated from Prussia, and assumed the title of king, at the peace concluded between Saxony and France at Posen (Dec. 11, 1806). His example was followed (Dec. 15, 1806) by the five Saxon dukes; and by the treaty signed at Warsaw, April 13, 1807, the two princes of Schwarzburg, the three dukes of the house of Anhalt, and the Princes of Lippe-Detmold, Schaumburg-Lippe, Reuss, and Waldeck, were admitted into the confederacy. The Kingdom of Westphalia, formed out of the provinces conquered from Prussia and other states, and assigned to Jerome Bonaparte, was likewise added to the Confederation of the Rhine, by the constitution confirmed by the Emperor of France, Nov. 15, 1807. Finally the Duke of Mecklenburg-Strelitz (Feb. 18, 1808), the Duke of Mecklenburg-Schwerin (March 22, 1808), the Duke of Oldenburg (Oct. 14, 1808), were admitted as members; so that the confederacy extended over a space of 125,160 square miles, with 14,608,877 inhabitants; and the confederate forces were increased from the originally stipulated number of 63,000 to 119,180. After Napoleon's Russian campaign of 1812 the whole structure fell to pieces. Mecklenburg-Schwerin and Mecklenburg-Strelitz were the first to quit the confederation (as they had been the last to join it). Other members hesitated for some time, among them the King of Saxony, who was punished by the loss of half his kingdom.

CONFERENCE, a meeting between delegates of the two houses of Parliament called to discuss the provisions of a bill with regard to which they are disagreed, with the object of effecting an agreement between them. The delegates representing the two houses are called managers. The conference must be demanded by that house which has possession of the bill when the necessity for holding a conference arises, and in doing so it must state clearly the subject on which it is to be held; but by whichever house the conference may be demanded, the House of Lords has the right of appointing the time and place at which it shall be held. The managers on both sides are usually furnished with reasons prepared by a committee of the house for the course which each house has resolved to take with reference to the measure whose provisions are discussed; and in that case the managers merely present these reasons without entering into the discussion of the main question on any grounds not comprised in them. Speeches made on either side are confined to remarks made by way of introducing the reasons of the committees of the two houses. If agreement is not effected in this way, after a second such conference has been held, what is called a free conference is usually held, in which the managers on either side are not restricted to reasons already prepared, but may urge whatever arguments they think likely to affect the representatives of the other house. After one free conference has been held on any subject, all other conferences on the same subject must be free. —The annual meetings of Wesleyan preachers for deliberation on the affairs of the body are called conferences. See CONGRESS.

CONFERVACEÆ, the second order, according to Lindley, of the Algæ, class Thallogens, of cryptogamous or flowerless plants. They generally inhabit fresh, but are sometimes found in salt water, are of various hues, green, olive, violet, and red; and occupy various positions, some in mud, others floating freely, but are for the most part attached either to rocks or other plants, as parasites. The well-known marine delicacy, laver (*Porphyra laciniata* and *P. vulgaris*), with the green laver (*Ulva latissima*), belongs to this tribe of plants.

CONFESSION. This term is sometimes applied to a profession of faith; for instance, the confession of Augsburg. (See AUGSBURG and REFORMATION.) It sometimes also signifies a religious sect; as the three Christian confessions—the Roman Catholic, the Lutheran, and the Calvinistic. *Confiteor* (I acknowledge) is the confession which the Catholic priests make before the altar when beginning mass or public worship.

CONFESSION, in law, is when a prisoner, after being arraigned, and hearing the indictment against him read, confesses the offence of which he is charged. Such confession is the most satisfactory ground of conviction.—In the German states, the confession of the prisoner, to be conclusive, must not only be made in open court, but must be accompanied by a disclosure, on his part, of the circumstances under which the crime was committed.—By the revised laws of New York a prisoner, instead of being asked whether he is guilty or not guilty, is asked whether he will be tried by the jury.

CONFESSION, AURICLAR, in the Romish Church, the disclosure of sins to the priest at the confessional, with a view to obtain absolution for them. The father confessor inquires of the person confessing concerning the circumstances of the sins confessed, and proportions his admonition and the severity of the penance which he enjoins, to the degree of the transgression. The person confessing is allowed to conceal no sin of consequence which he remembers to have committed, and the father confessor is bound to perpetual secrecy. The absolution granted thereupon has, according to the doctrines of the Catholic and Greek Churches, sacramental efficacy. But the Holy Scripture does not contain an express decision on this point, and the custom of confession before taking the Lord's supper was not established in the oldest Christian congregations. Whoever was guilty of great sins made a public acknowledgment of them, and a profession of repentance before the assembled congregation. This was usually committed to writing, and read by the penitents. Pope Leo the Great, in 450, altered this public confession into a secret one before the priest. The fourth general Lateran council, held in 1215, ordains (can. 21) 'that every one of the faithful, of both sexes, on coming to years of discretion, shall, in private, faithfully confess all their sins, at least once a year, to their own pastor, and fulfil, to the best of their power, the penance enjoined them, receiving reverently, at least at Easter, the sacrament of the eucharist, unless, by the advice of their pastor, for some reasonable cause, they judge it proper to abstain from it for a time, otherwise, they are to be excluded from the church while living, and when they die to be deprived of Christian burial.'

CONFESSIONAL (from *confessionis*, Lat.), in architecture, a cell in a Catholic church, wherein the confessor sits to hear confessions. The confessional, of which there are many in every Roman Catholic church and chapel, is a species of cell, built of joinery, with a boarded back next the wall, or against a pillar or a pier, divided into three niches or small cells. The centre, which is for the reception of the priest, is closed half-way up by a dwarf-door, and has a seat within it. There is a small grated aperture in each of the partitions between him and the side-cells, which are for those who come to confess, and have no doors. The sight of the numerous confessionals in St. Peter's church at Rome, each with an inscription, setting forth in what language penitents can confess within, is rather curious.

CONFESSION OF AUGSBURG. See AUGSBURG CONFESSION.

CONFESSION OF FAITH, a document prepared by the Assembly of Divines which met at Westminster in obedience to an ordinance of Parliament issued June 12, 1643. The whole number of the Assembly amounted to 174 members, thirty-two of whom were members of Parliament appointed as lay assessors. The greater part of the Assembly were Puritans. There were six Scottish commissioners, four ministers and two elders, who were appointed to consult and deliberate, but not to vote. One of the chief results of the deliberations of the Assembly was the framing of the Confession of Faith, which, on the return of the Scottish commissioners, was laid before the General Assembly of the Church of Scotland, by whom it was adopted as the standard of the church by the act of Assembly of August 27, 1647. It has since been adopted by the other Presbyterian Churches of Scotland, by the United Presbyterian Church, however, with some reservations.

CONFIDENTIAL COMMUNICATION, a communication made by one person to another which the latter cannot be compelled to give in evidence as a witness. Both in England and Scotland all communications made between a client and his agent, between the agent and the counsel in a suit, or between the several parties to a suit, are treated as confidential; but in some minor points the practice varies in the two countries. In England, for example, the privilege extends to all communications whatsoever made to a legal agent, whether these refer to any depending or anticipated suit or not; while in Scotland this is a point of law still undecided. Legal agents are of course required to produce any papers intrusted to them by their clients, which the clients themselves would otherwise have been required to produce. The privilege of confidentiality does not extend to disclosures made to a medical adviser, even although it may have been necessary for the patient to make them in order to enable the physician to understand and treat his case. In England it has been decided also that confessions made to a priest are not to be treated as confidential, but many judges refuse to demand the disclosure of them. In Scotland, on the other hand, the law with regard to this point is uncertain. Communications made between husband and wife during marriage are not admissible as evidence, although in most civil cases a husband and wife may legally be called as witnesses against each other.

CONFIRMATION, a ceremony intended for the completion of baptism, and considered by some churches as a sacrament. The Council of Trent settled several points concerning it (sess. vii. De Sacram.). It is administered by bishops. The ceremony consists in the imposition of hands on the head of the person to be confirmed, accompanied with the holy unction. No other priest can confirm. The meaning of this sacrament may be best learned from the Acts of the Apostles (ch. viii. 14–21; xix. 1–6). Paul (in Heb. vi. 1, 2) speaks of the imposition of hands as a custom to be perpetually observed among Christians. Confirmation, however, is considered by the Catholics a useful but not a necessary sacrament. Baptism can be administered even by a heretic, but not confirmation. In the Greek Church, and other oriental sects, the sacrament of confirmation

follows immediately after baptism, and is administered as in the Romish Church. The Protestant Episcopal Churches of England and America, as also the Lutheran, have retained the practice of confirmation. It is, with individuals of these sects, an assumption of the obligations which others undertook for them at their baptism. In Germany, confirmation among Protestants is one of the most solemn acts, and takes place only after a certain course of instruction in the Christian faith. The Lord's supper is not taken by these three sects until after confirmation.

CONFISCATION, the act of condemning as forfeited, and adjudging to the public treasury, the goods of a criminal in part punishment of a crime.

CONFUCIUS (also KONG-FU-TSE, and KUNG-FU-DSU, that is, 'the teacher, Kong' or 'Kung'), a teacher of religion and morals, who, like Solon and Zoroaster, exercised an extensive influence on his own and succeeding times, and now, after thousands of years, is still venerated by his countrymen, and respected by other nations, lived about 550 years B.C. He was born in the province of Shan-tung, which then belonged in part to the small vassal kingdom of Lu. He was of royal descent, and held the rank of a mandarin at court, but as the king would not follow his advice, he resigned his dignity, and became a teacher of morals. He led a quiet and temperate life, and was distinguished for his wisdom. He neither attempted to overthrow existing establishments, nor to gain dominion over the minds of men by deceit, but only to disseminate precepts of virtue and wisdom. He taught in the cities and at royal courts. Many hearers assembled about him, and he became the founder of a numerous sect, which still exists in China, and has extended to Cochin-China. On his return to Lu he was received with great honour, and succeeded for a time in improving the morals of his native state; but the inhabitants soon became corrupt again, and Confucius in despair resumed his wanderings. In his last years he again returned to his own land, where he is said to have died B.C. 479. After his death great reverence was paid to his memory. Various titles were conferred upon him, and temples were dedicated and sacrifices offered up to him as to a god. We are told that his descendants are still settled in the same place in which he himself lived, where they are held in great esteem. His religious opinions are very uncertain: it does not appear that he changed or purified the prevailing faith. It is certain that he inculcated it as a duty on his disciples to revere their ancestors. We are better acquainted with that part of his doctrines which relates to common life, and contains general precepts of practical utility. In the most impressive manner he enjoined universal benevolence, justice, virtue, and honesty, and the observance of all usages and customs which had been once introduced; it being proper that they who live together should live in the same manner, and sympathize in each other's pains and pleasures. Sometimes he inculcates reverence of old age; sometimes he shows how the tendencies of children should be guided, and their rising passions corrected. Sometimes he speaks of the peaceful virtues of domestic life, and sometimes he exhorts monarchs to exercise justice and humanity. He praises the delights of friendship, and teaches the forgiveness of offences. As a lawgiver, he deserves less honour. It cannot be denied that he extended the limits of paternal authority too far; for he allowed parents even the right to sell their children. It was a sophism unworthy of his wisdom to say, as children can sell themselves, no one should hesitate to give this right to the authors of their existence. Confucius erred especially in viewing legislation as nothing but a branch of morals, and was satisfied therefore with giving general precepts on this subject. Moreover, esteem for the early lawgivers of his people hindered him from making careful investigations for himself: he acquiesced rather in the decisions of those celebrated men of whom he called himself the disciple. There are five canonical books of Confucius, the Tih-king, the Shu-king, the Shi-king, the Le-king, and the Chun-tsien. Among his other works are the Ta-hëo or Great Study, the Chung-Yung or Invariable Mean, and the Tun-yu or 'Philosophical Dialogues.' The last three are among the Chinese classical works commonly called the Four Books. The last of these four books is entitled Hi-tse, and was written by Meng-tse or Mencius, the most distinguished of the early disciples of Confucius. The first volume of the works of Confucius, original text, with an English translation by J. Marshman, was published at Serampore in 1809, but no more of this work has appeared. The works of Confucius and his disciples were translated into German by W. Schott (Halle, 1826, and Berlin, 1832).

CONGÉ D'ESLIRE, the Norman French for 'leave to elect,' designates the sovereign's license authorizing the dean and chapter of a vacant see to proceed with a new election. The nomination to bishoprics, originally understood to have been vested in the Christian people, who made it by election, was afterwards transferred to the sovereigns of most states, and remained with them till the eleventh century, when, by the assistance of the pope, it was wrested from them and conferred upon the clergy. In England the Constitutions of Clarendon, in 1164, conferred the election on the chapters, and this right was formally confirmed by Magna Charta, subject, however, to a right in the sovereign to grant a *congé d'eslire*, and also to confirm the chapter's choice. Thus matters remained till the Reformation, when the crown made a very important encroachment, and provided by 25 Henry VIII. cap. xx., that though the dean and chapter were still required to go through the form of an election, the person to be chosen should previously be absolutely fixed by the sovereign. This act is still the regulating statute, and not only provides that on every vacancy in a see the sovereign may grant a license to proceed to the election of a successor, and with it a letter containing the name of the person to be elected, but that if the dean and chapter delay the election beyond twenty days, or elect any other person than the one named in the letter, or do anything else in contravention of the act, they incur the penalties of a *præmunire*.

CONGER-EEL (*Conger*), a genus of marine eels characterized by a long dorsal fin beginning near the nape of the neck, immediately above the origin of the pectoral fins, and by having the upper jaw longer than the lower. The best known member of this genus is the *Conger vulgaris*, which is abundant in all European waters. It is distinguished from the other species by having the dorsal and the anal fins of a whitish colour, but fringed with black, and the lateral line spotted with white. The upper parts of this fish are of a uniform pale brown colour, which becomes lighter at the sides, and on the under parts passes over into a dirty white. It is a very large fish, sometimes attaining a length of 10 feet, and more than 100 lbs. in weight. In the Baltic Sea and the German Ocean it prefers rocky coasts, where it conceals itself in holes and clefts. On a sandy bottom it has the power of concealing itself by burying itself in the sand. It is a remarkably voracious animal, not even sparing the weaker members of its own species. The strength of its jaws is sufficiently great to enable it to crush mussels with ease. It is sometimes caught in crab cages, into which it had in-

troduced itself for the sake of the crabs. The spawning time falls in December or January. Although its flesh is not held in much esteem, yet the conger-eel fishery is important, as it affords a cheap food to the poorer classes. It is caught in abundance off the Cornish coast.

CONGESTION (from the Latin *congestio*, the act of heaping; carrying together). The different parts of the human body do not always receive the same quantity of blood, but sometimes more, sometimes less. Thus, for instance, during digestion it flows towards the stomach and the liver; during violent or long-continued speaking, singing, or running, it collects in the lungs and the heart; during close thinking, in the brain. In general the blood flows in greater quantities into any part in proportion to the action of that part; but, in a state of health, it flows off with as much rapidity as it collects. Sometimes, however, too much blood accumulates in an organ, and remains too long in it; and this injures the structure and the function of such an organ. This accumulation of blood arises from a diseased state of the system, and is called *congestion*. Congestion may be caused by whatever in general accelerates the circulation of the blood, and causes it to tend to a particular part; thus, for instance, among the causes of congestion are the different periods of development of the human body, each of which renders some particular organ unusually active; the crisis of disease; and, lastly, the accidental exertions of certain organs. Under such circumstances congestion is caused by an excited state of the arteries in general, and of some particular ones especially. Secondly, if the current of blood to one organ is checked it accumulates in another. Hence colds caught through exposure of the feet, also the suppression of the secretions, &c., so often cause congestion. Thirdly, the vessels which bring back the blood—the veins—are sometimes in a condition unfit to answer their destination; as, for instance, if they are already too full, if their power to receive the blood and to propel it is lost or diminished, or if they are prevented from performing their function by external pressure, or by tumours. Hence congestions are divided into active and passive; those of the arteries, and those of the veins. Where the blood accumulates the part becomes red and hot, the pulse beats more violently, and the veins expand; the part swells, and a feeling of sickness, pain, pressure, &c., comes on. The functions of the part change; if the congestion is slight, they become more active. In higher degrees of congestion, and if it is continued for a long time, the functions are checked, weakened, and sometimes entirely destroyed. Now, as every organ has its peculiar function, it follows that the symptoms of congestion, resting on these grounds, must be very different, according to the different organs in which it takes place. During the congestion of blood in one organ the other organs exhibit symptoms of want of blood, viz. coldness, paleness, diminution of size, and weakness. Congestion generally lasts but a short time; but if not early cured, and its return, which would otherwise be frequent, prevented, it is only the beginning of other diseases. Sometimes it terminates in bleeding, which is a remedy for it; sometimes it increases into inflammation; sometimes it becomes a chronic disease, that is, the blood accumulates for a long time, and expands the veins; the expansion becomes permanent, and the original excitement is succeeded by a state of torpidity and weakness, which is called *stagnatio*, or *infarctus*.

CONGLETON, a market town and borough, England, Cheshire, in a deep valley on the Dane, 22 miles S. of Manchester. Many of the houses, formed of timber framing and plaster, have a very antique appearance. Congleton was early distinguished for the manufacture of gloves and leather laces, called *Congleton points;* but these have been long superseded by cotton and silk manufactures, the latter now forming the principal trade of the town. The inhabitants are chiefly employed in silk throwing and spinning; besides which waistcoats and ribbons, of a very superior description, handkerchiefs, and various other articles, are manufactured. There are also foundries, agricultural implement works, tanneries, breweries, rope-walks, works for the cutting of fustian, &c. Parnell, the poet, was a native of Congleton. Pop. in 1871, 11,344.

CONGLOMERATE, a term applied by geologists to rocks consisting mostly of water-worn pebbles compacted together. They are called *pudding-stone* when the pebbles are rounded, and *breccia* when they are angular. Quartz pebbles constitute a common form of conglomerate, and others embody limestone, granite, slate, &c.

CONGO, a territory in South-west Africa, discovered by the Portuguese navigator Diego Cam, about 1485. By the Portuguese the name was applied to the whole tract of coast country extending from Cape Lopez, lat. 0° 36′ S., to Cape Negro, lat. 15° 40′ 42″ S., now known under the names of Loango, Congo, Angola, and Benguela. During this period Christianity was introduced by the Portuguese, and spread with extraordinary rapidity; but before the end of the eighteenth century every trace of it had disappeared. Congo, as now understood, is a comparatively limited and little known tract, lying south of the river Congo or Zaire, and bounded S. by the Dande, including in all about 200 miles of coast. It is remarkably fruitful, and rich in copper and iron ores. Its capital is St. Salvador, or Banza-Congo, the residence of the dominant chief. It appears to have been at one time a well laid out town, with rows of regular streets, traces of which are still to be seen in the neighbourhood of the royal palace.

CONGO, ZAIRE, or MOIENZI ENZADDI (that is, the 'Great Stream,' or the stream that absorbs all the others), a large river in South-west Africa, having its embouchure in the South Atlantic; lat. 6° S.; lon. 12° 40′ E. Of its origin and affluents hardly anything is known; but, according to the accounts of the natives, it issues from an extensive marsh to the north of the equator. Dr. Behm identifies it with Livingstone's Lualaba. At its mouth it is 10 miles wide; a little higher up it diminishes to 7; and at 140 miles from the sea narrows commence and continue for 40 miles, through which space the river is not generally more than from 300 to 500 yards wide, and mostly confined between lofty rugged rocks, where tremendous falls and cataracts occur; and below, where it begins to expand, are fearful whirlpools. Above the narrows, for about 100 miles, the river again expands to a breadth of 2, 3, and even more than 4 miles, flowing with a current of 2 or 3 miles an hour. It is estimated that the Congo pours into the sea a larger volume of water than the Mississippi. Immediately off its mouth Captain Tuckey found no bottom with 150 fathoms of line, the velocity of the stream varying from 2½ to 5 knots an hour; 13 miles from the entrance the water is perfectly fresh, of a dingy red colour; it ferments in a few days, and remains for some in a highly putrescent state, discolouring silver greatly, but it afterwards becomes perfectly clear and colourless, and deposits no sediment. The rise of the Congo, at its highest flood, is, towards its mouth, about 12 feet, and every third and fourth year it is said to rise to a greater height than it does in the intermediate years. An expedition under Lieut. Grandy sailed from Liverpool to explore the Congo, on the 30th

of November, 1872. The plan of the expedition was to go overland from Loanda to the highest point on the Congo reached by Tuckey, and thence to pursue the course of the river upwards. A German expedition was equipped and despatched a little later with a similar object.

CONGREGATIONALISTS, a numerous body of Christians, chiefly found in Great Britain and its colonies, and the United States. They profess to derive their principles of church government from the polity established by the apostles, and preserved in the primitive church for more than a century after Christ. They disclaim having any founder but the apostles, though it was in the reign of Elizabeth, about the year 1580, that in England these principles were promulgated by Brown and Barrow; those who adopted them were called Brownists and Barrowists. Between thirty and forty years later similar opinions were expressed, but in a more moderate form, by Henry Jacob and John Robinson, both English exiles at Leyden, in Holland—by the former in a work entitled Declaration and Plainer Opening of certain points, and by the latter in his Apology. From about this time the sect came to be called by some Independents, although this designation does not appear to have become general till about 1640. At first the cause of Independency made little progress; but early in the reign of Charles I. (1625–49) their doctrines had found some acceptance, which rapidly increased amid the troubles that attended its progress and close. For a short time, indeed, after the decline and fall of Episcopacy, Presbyterianism took the ascendency in England, being countenanced from political motives by the leading republicans there; but these, including Cromwell, their chief, being either Independents, or haters of all Establishments, the cause of Independency gained considerable ground. But while numerous and influential in the latter part of the reign of Charles I., they were still objects of extreme jealousy. The palmy days of Independency were during the period of the Protectorate. Soon after the Restoration, however (1660), when Episcopalianism revived, Independents and Presbyterians, once rivals, became victims alike of a common oppressor; and their persecution or annoyance was continued with but slight intermission throughout the reigns of Charles II. and James II. Into the details of the history of Independency during this period our narrow limits forbid us to enter; suffice it to say, its oppression lasted nearly twenty-eight years, and was only closed by the Revolution of 1688; shortly after which the famous act of toleration under William and Mary (1689), although clogged with several grievous and unjust impositions, secured religious liberty to all classes of Protestant Dissenters, with some small exceptions. Since this epoch the Independents have steadily increased, both in numbers and respectability, and under their present name of Congregationalists (or more correctly Congregational Independents) they form one of the largest bodies of Dissenters in England. In Scotland the body is by no means so strong.

The following summary of the doctrines, and account of the constitution of the Congregationalists is gathered from the pages of a writer of some respect in their own body:—They believe in the inspiration of the Scriptures; in the Divinity of the Father, Son, and Holy Ghost; the Trinity in Unity; the fall of man; his recovery by the sacrifice of Christ, and the work of the Spirit; justification by faith alone through free grace; holiness of life as the evidence of Christianity; and infant baptism. Their doctrinal sentiments in general are moderately Calvinistic, but they reject creeds and confessions. In church government they hold that believers voluntarily assembling to observe religious ordinances constitute a Christian church; that Christ is the only Head of the church; the New Testament their only statute-book; bishops or pastors, and deacons, their only officers; and that each church thus constituted is independent of the authority of all others, and though it may hold fraternal intercourse with them, yet can permit no authoritative interference; none are admitted as members but those who make a credible and consistent profession of Christianity, the admission or rejection of members depending on the votes of the church; their church officers, the bishops and deacons, are also chosen by the votes of the members, and the former ordained to their office by special prayer and the imposition of hands by those already in office—though this rite is not supposed to convey any new virtue or authority; they admit, as occasional communicants at the Lord's table, Christians who differ from them on minor points. A large proportion of the Congregational churches were formed in 1830 into a union, called the Congregational Union, which meets twice a year for business affecting the general body. The Congregational Independents of Great Britain possess various institutions, more or less endowed, for the education of candidates for the ministry. The total number of churches belonging to the Congregational Union of England and Wales is above 3000, in addition to which there are about 600 churches in the colonies connected with the same union. There are upwards of 100 belonging to the Congregational Union of Scotland, and about thirty in the Congregational Union of Ireland. The number of their congregations in the United States is considerable, but it is difficult to estimate them exactly, because the name of Independents is often given to religious denominations which have little in common.

CONGREGATIONS, in the Papal government, meetings or committees, consisting of cardinals and officers of the pope, to administer the various departments, secular and spiritual, of the Papal dominion. To these belong the Inquisition (congregation of the holy office), the congregation for the explanation and execution of the decrees of the Council of Trent (*de concilio*), the congregation *de propaganda fide*. (See PROPAGANDA.)—Congregation also signifies a society of several convents of the same rule, which together form an organized corporation, hold chapters, and elect superiors. The province of an ecclesiastical order is also called a congregation. Congregation is likewise used to signify an assembly met for the worship of God, and for religious instruction.

CONGRESS, in international politics, a meeting of the rulers or representatives of several states, with a view of adjusting disputes between different governments. A congress is a simple means of determining in a diplomatic way the conflicting claims of belligerent powers, or of states whose interests interfere with each other, and thus of preparing or concluding peace, or preventing a rupture, and of mediating between the different interests of different nations. At the same time, it is very common for a congress to assume illegal power in respect to particular governments or nations, because a congress affords governments of the same way of thinking so much opportunity of concentrating their forces. The plenipotentiaries of the dissentient, or of the mediating powers, assemble at an appointed place, commonly on neutral ground, and, partly by notes, partly by verbal communication, carry on their negotiations. It is necessary to distinguish the preliminary congress, in which the preliminaries are settled (such as the consent and the representation of the different powers, the place and time of the meeting, the extent of the neutral ground, the security of ambas-

sadors and public messengers, the ceremonial, and the method of transacting business), from the principal congress, which is to bring the affair in question to a decision. These preliminaries are commonly settled in the diplomatic way by the mediating powers, and then the principal congress assembles. The plenipotentiaries when they meet, after mutual greetings, appoint, in a preliminary conference, the day on which the congress is to be opened, and determine the manner in which business is to be transacted, the forms of negotiation, the order of precedence among the different powers, and the time of session. The congress opens by the exchange and perusal of credentials among the plenipotentiaries, which, in case the negotiating parties have referred to the arbitration of a mediator, are given to him. The envoys of the contending powers then carry on their negotiations directly with each other, or by the intervention of a mediator, either in a common hall or in their own residences by turns, or, if there is a mediator, in his residence. These negotiations are continued either by writing or by verbal communication, until the commissioners can agree upon a treaty, or until one of the powers dissolves the congress by recalling its minister. Such meetings of the representatives of different countries are sometimes called conferences. The nominal difference between a conference and a congress is this, that the representatives of the different countries at the former are the ordinary ambassadors of the respective countries at the court at which the conference is held, while the representatives at the latter are specially deputed for the purpose. This distinction, however, does not hold good in fact, since there have been some conferences in which at least one of the representatives was specially appointed by his government to represent it on the questions discussed by the conferences.

CONGRESS, the name given to the legislative assembly of the United States of America, consisting of two houses—a Senate and a House of Representatives. The Senate consists of two members elected by each state for a period of six years, one-third of whom are elected every two years. The representatives in the lower house are elected by the several states every two years, and their number varies in each state in proportion to the population as determined by the decennial census. The united body of senators and representatives for the two years during which the representatives hold their seats is called one Congress. See UNITED STATES.

CONGREVE, WILLIAM, a celebrated British dramatist, descended from an ancient English family in the county of Stafford, was born in 1670. His father held a command in the army. Young Congreve was educated in Ireland at the free school of Kilkenny, to the neighbourhood of which his father had been led in the course of service. From Kilkenny he removed to Trinity College, Dublin, and thence to the Middle Temple, London, to prepare himself for the legal profession. Here he soon deserted the law for the pursuits of polite literature. At a very early age he wrote a novel entitled the Incognita, which is sprightly, involved, and not natural. This was followed, at the age of twenty-one, by his comedy of the Old Bachelor, pronounced by Dryden the greatest *first* play that he had ever beheld. Its success acquired for the author the patronage of Lord Halifax, who immediately made him a commissioner for licensing hackney-coaches; soon after gave him a place in the pipe office; and finally conferred on him a very lucrative place in the customs. He afterwards received an additional sinecure in the appointment of secretary to the island of Jamaica. His next play, the Double Dealer, was not very successful in representation; but his third, the comedy of Love for Love, proved extremely popular. Not content with his fame in comedy, he now essayed tragedy; and in 1697 produced his Mourning Bride, the reception of which was extremely favourable. The composition of four such plays before he had attained the age of twenty-eight, is a remarkable proof of early genius in a line of composition demanding great observation and experience. He soon after closed his dramatic career with the Way of the World, considered by many critics as the most perfect of his comedies, but which was, notwithstanding, received so coldly that he resentfully determined to relinquish a species of writing in which, upon the whole, he had been eminently successful. A masque, entitled the Judgment of Paris, and Semele, an opera, the latter of which was never represented, close the list of his labours for the stage. He, however, continued to write occasional verses on public subjects; and in 1710 published a collection of his plays and poems, which he dedicated to his early patron, Lord Halifax, to whose person and party he remained attached in all fortunes. Congreve abstained from the party contention to which the wits of his day were addicted—a moderation which secured him many compliments from his literary brethren. Steele dedicated to him his Miscellanies, and Pope his translation of the Iliad. He died in January, 1729, in his sixtieth year. Congreve's comedies are chiefly distinguished for the sustained flow of wit in the dialogue. It is now rare for any of his plays to appear on the stage, which without pruning, to adapt them to modern manners, it would be impossible for them to do. His other poetry is of little value.

CONGREVE, SIR WILLIAM, BART., inventor of the rockets called by his name, was born in the county of Middlesex, England, in 1772. He was educated for a military life, entered the army, and retired in 1816 with the rank of lieutenant-colonel of artillery. He invented the rocket about 1804. It was first used in active service in the attack on Boulogne, 1806, and on Copenhagen, 1807. The Emperor of Russia sent Sir William the decoration of St. Anne for its service at the battle of Leipzig in 1813. It was also used at Waterloo, and has since become general, though with important modifications. Sir William, after retiring from the army, sat in Parliament, and took an active part in the army improvements introduced by the Duke of York. He became a fellow of the Royal Society in 1811; obtained a patent for manufacturing gunpowder in 1815, and one for the manufacture of bank-note paper in 1819. He wrote various treatises—An Elementary Treatise on the Mounting of Naval Ordnance (London, 1812), and a Description of the Hydro-Pneumatic Lock (London, 1815). He died at Toulouse in France, May 16, 1828. For an account of the Congreve rocket, see ROCKET.

CONHYDRIN ($C_8H_{17}NO$) was discovered by Wertheim in 1856. It is contained, along with conia, in the flowers and seeds of the hemlock alone, these bases not having been yet detected in any other plant. The relative amounts are very different, however, for Wertheim got from some 6 cwts. of seeds about 25 oz. of conia, and only $1\frac{1}{2}$ oz. of conhydrin. Conhydrin is got by treating the pounded flowers or seeds with lime or potash, or better, by first exhausting the flowers or seeds with hot acidulated water, distilling with potash, and then neutralizing the distillate, which contains conhydrin conia, a volatile oil, and much ammonia, with sulphuric acid, separating the oil and evaporating. By strong alcohol and ether the sulphates of the alkaloids are dissolved, while the sulphate of ammonium is left behind. The spirit is then distilled away, and the residue warmed

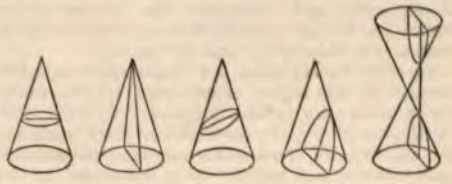
with water is mixed with strong potash and rapidly distilled to dryness. It is better, however, to shake up the potash solution with ether, which dissolves the bases. The ethereal solution evaporated, and then cautiously distilled in a current of hydrogen, first yields impure and then pure conia, and at length, when the temperature rises to between 300° and 400° F., a crystalline sublimate of conhydrin forms in the retort. This sublimate is dissolved, frozen, pressed to get rid of conia, and crystallized repeatedly from ether. It forms highly iridescent, pearly crystalline, perfectly colourless plates, which begin to sublime slowly even under 212°, fuse about 250° F., and boil about 440° F., volatilizing completely, and giving off an odour like conia. It is soluble in water, but more readily in alcohol and in ether. Its solutions are strongly alkaline. It is a very stable body, not being attacked by cold nitric acid, or by heating with dilute sulphuric acid, or by potash or baryta. Phosphoric anhydride, however, withdraws from it the elements of water, and converts it into conia. It forms a number of salts, some of which crystallize, while others are syrupy liquids. The hydrochloride was formerly described as an uncrystallizable liquid, but quite recently it has been got in tolerably stable crystals from solution in shale spirit. The physiological action of conhydrin resembles that of conia, but it is not nearly so rapid or powerful. Symptoms of intoxication were produced in a rabbit by a dose of 5 grains; but these disappeared in an hour, while a similar quantity of conia was fatal in two minutes.

CONI, or CUNEO, a town, Kingdom of Italy, capital of the province and district of Coni, on a high hill, at the confluence of the Stura and the Gezzo, 47 miles s. Turin. It is surrounded by a simple wall, and has two gates. The principal street has arcades throughout its whole length, and displays a series of handsome shops. The other streets are mere lanes. There are silk spinning-mills, and manufactories of various kinds of silk and woollen goods. The position of the town is highly favourable to trade, as all the merchandise passing from the seaport of Nice to Lombardy, Switzerland, and Germany, goes by this route. Grain, hemp, and silk, produced in the neighbourhood, also form articles of commerce. Two fairs are held annually. The position of Coni has also made it the object of frequent military operations. It was taken by Napoleon in 1796, by the Austrians in 1799, and again given up to the French in 1800. Coni is the seat of a bishop. Pop. 12,797.

CONIA, CONIINE, CICUTINE ($C_8H_{15}N$), was got as an impure sulphate in 1827 by Giesecke, in the hemlock, and was subsequently prepared in the pure state by Geiger, who recognized it as a vegetable base. It exists, combined with malic acid, in all parts of the plant, but especially in the not quite ripe seed, from which it is isolated by the process described under CONHYDRIN, the separation turning on the volatility of the base. When pure it is a colourless oily liquid, specific gravity 0·878, which changes by exposure to air to a brown fluid, and ultimately to a resinous, bitter mass, insoluble in water, but soluble in alcohol, and when purified yielding a jelly, with a butyric odour. It can be distilled without much alteration, provided the air be excluded, its boiling-point being about twice that of water. At a higher temperature it burns with a bright smoky flame. It is slightly volatile even at ordinary temperatures. It has a very disagreeable odour, sharp and choking when strong; but in small quantity like that of mice. Its taste is equally nauseous. It is somewhat soluble in water, readily in alcohol, ether, and oils, and itself acts as a solvent of sulphur. It has a strong alkaline reaction when moist, and combines with the acids to form salts, most of which are crystalline but deliquescent. The salts are unstable in aqueous solution; they evolve the odour of the base and gradually change colour. It precipitates the oxides of iron, zinc, manganese, aluminium, copper, and the other heavy metals, from solutions of their salts. It is attacked by chlorine, bromine, and iodine, oxidized by nitric acid, yielding butyric acid, converted by nitrous vapours into a substance *axoconhydrin*, which yields a hydrocarbon called *conylene*, and by iodide of ethyl into substitution derivatives.

The poisonous action of conia has been minutely investigated, but although it has been proved to be rapidly fatal to all classes of animals when administered in doses of from 3 or 4 to 10 or 12 grains, the nature of its action is not fully ascertained; but the breathing and pulse are affected, and the extremities paralyzed. Some experimenters have tried its effect upon themselves, and according to their account the minutest doses produce burning in the mouth, salivation, nausea and vomiting, pressure in the head, tottering, indistinct vision, cramps, and other symptoms. Similar observations have been made on persons to whom the alkaloid has been given therapeutically. It has been shown recently that conia can be detected in a poisoned animal, even after a considerable time. The tonic power of conia seems to be little if at all affected by the introduction into it of the alcoholic radicles, methyl and ethyl. The action is perhaps not so rapid, but it is the same in character, and takes place with quite as small quanties. In this respect conia differs from some other alkaloids, for instance, CODEIA.

CONIC SECTIONS. Three curves, the hyperbola, the parabola, and the ellipse, are called the conic sections, because these curves are formed by the intersection of the surface of a cone with planes that cut the cone in various directions. If the cutting-plane be parallel to the axis of the cone (fig. 1), the curve formed is the hyperbola, which has two branches, as shown in the figure. If the cutting-plane be parallel to a straight line on the surface of the cone (fig. 2), the curve formed is a parabola. Any other section is an ellipse (fig. 3). It must be noticed, however, that this general description includes three



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peculiar cases. In the case of a plane parallel to the axis of the cone, when that plane contains the axis, the section, instead of being a hyperbola, is in this limiting case a pair of straight lines crossing each other at an angle equal to that of the angle of the cone (fig. 4). When a plane, which would otherwise form a parabolic section, is a tangent plane to the cone, the parabola degenerates into a straight line passing through the vertex of the cone. Lastly, when a plane that would otherwise form an ellipse is perpendicular to the axis of the cone, the ellipse becomes a circle (fig. 5). The properties of these curves are discussed under their several names. It will there be seen that other definitions may be given of the curves; and that from these their properties are more conveniently derived than from the consideration that they are formed by the sections of a conical surface. The properties of these curves are of the greatest physical interest; and the geometry of the

conic sections has, ever since the time of the Greek mathematicians, been considered as the best of the more advanced geometrical studies.

CONIFERÆ, the principal family of dicotyledonous *Gymnospermæ*, the essential character of which consists in the manner in which the ovules, not inclosed in an ovary, receive directly the action of the pollen without the intervention of a stigma. The ovules in these plants are borne on scales or modified leaves, which are spread out, not folded, and generally grouped in such a manner as to form a cone composed of a greater or smaller number of these leaves, of which only a portion may be fertile and bear ovules. The disposition of the ovules in relation to these scales permits of a division of the Coniferæ into three distinct families or tribes. In the *Cupressineæ* the cones are formed of simple scales, resulting from a transformation of leaves, each of which bears towards the base of its superior surface the ovules erect and sessile, in which the chalaza corresponds with the point of attachment, and the micropyle is directed towards the free extremity of the scale. The ovules are variable in number, two on each scale in the genera *Thuya*, *Juniperus*, and *Taxodium;* six or ten, disposed in two ranks, in the *Callitris* and the *Widdringtonia;* a still greater number in the *Cupressus*. The second family, *Abietineæ*, has in place of simple scales, scales actually double or formed of two parts. The lower one, narrower, sometimes much shorter, sometimes longer than the one which bears the ovules, has been habitually designated the bract; the other, placed above this and united with it at the base, is in general thicker, larger, and often longer than the under one, and bears at its base the ovules reversed, that is with the point of attachment and the chalaza directed towards the free extremity of the scale, and the summit or micropyle to the point of attachment of the scales. These ovules are sometimes completely free, only adhering to the base of the scale; sometimes the winged membrane which borders them is united to the upper face of the scale, and only separates from it at the maturity of the seed. The ovule appears thus inclosed in a cavity of the scale, open only at the point which corresponds to the micropyle. This structure is observed in *Pinus*, *Abies*, and *Araucaria;* the borders of the ovules are, on the contrary, free in *Cunninghamia*, *Arthrotaxes*, *Sciadopitys*, and *Dammara*.

In these two families the ovules are completely covered by the scales which constitute the cones, which unite after fecundation, and inclose the seeds till their maturity. In the *Taxineæ*, which constitute the third family, the scales are short, imperfect, and partly sterile, and neither cover the ovules at the period of fecundation nor at that of maturation. The ovules are usually set in the same manner as in the *Cupressineæ*. This is the case in *Taxus* and *Torreya*, where each small cone only presents a single terminal ovule; in *Gingo*, where there are two at the summit representing a terminal leaf; in *Phyllocladus*, where there are several. In *Podocarpus* and *Dacrydium* one or two of the superior scales bear each a reversed ovule. Although the Coniferæ usually present only a single embryo in the ripe seed, they contain, in general, in their ovules several rudiments of embryos, generally four, of which only one is developed.

The Coniferæ are found in large forests in the north of Europe and America, and are of great importance as timber trees. The leaves are coriaceous and stiff, persistent in most species; the male flowers consist essentially each of a stamen, sometimes naked, sometimes accompanied by a scale in the axilla, or placed on the lower surface of one. Not unfrequently several stamina are united by their filaments.

CONIROSTRES, in ornithology, a subdivision of the order *Passerinæ*, made in 1806 by Dumeril, and adopted by Cuvier, who enlarged it. It consists of those genera which have a stout conical beak, generally without emargination. In proportion as the beak is stronger and thicker they subsist more exclusively upon grain. The best known genera are the larks (*Alauda*), tits (*Parus*), finches (*Fringilla*), sparrows (*Pyrgita*), goldfinches (*Carduelis*), linnets (*Linaria*), bullfinches (*Pyrrula*), crossbills (*Loxia*), starlings (*Sturnus*), crows (*Corvus*), birds of paradise (*Paradisæa*).

CONIUM. See CICUTA AND CONIUM.

CONJEVERAM (CANCHIPURA, the Golden City), a town, Hindustan, Carnatic, 48 miles S.W. Madras, lat. 12° 49′ N.; lon. 79° 41′ E. It stands in a valley, is irregularly built, and from 5 to 6 miles long, resembling rather a series of villages, intermingled with gardens and cocoa-nut plantations, than a town. There are here two splendid pagodas; one dedicated to Vishnu Conjee, richly sculptured, and highly venerated by the Hindus; the other, a larger and more imposing structure, dedicated to Siva, from the summit of which a magnificent view is obtained. There are many smaller pagodas; and *choultries*, or houses of accommodation for travellers, abound. Red handkerchiefs, turbans, and cloths adapted for native dresses, are manufactured here. The town is surrounded by a hedge of the American aloe, a plant formerly much used in India as a defence against sudden incursions of mounted bandits. A school here, connected with the Free Church of Scotland Madras Mission, is attended by over 300 pupils.

CONJUGAL RIGHTS, in law the right which husband and wife have to each other's society, comfort, and affection. The suit for restitution of conjugal rights is a matrimonial suit, cognizable in the Divorce Court, which is brought whenever either the husband or wife is guilty of the injury of subtraction, or lives separate from the other without any sufficient reason; in which case the court will decree restitution of conjugal rights. (Wharton's Law Lexicon.)

CONJUGATION. See VERB.

CONJUNCTION, in grammar, one of the methodical divisions of language commonly called parts of speech. A conjunction couples either single words or clauses forming complete propositions, but it is not correct to say, as some authorities do, that it always connects propositions. 'The sun and moon shine' (Latham) may be amplified into the 'sun shines and the moon shines,' although it may be questioned if the meaning conveyed by the amplified phrase is absolutely identical with that of the contracted one; but into what two propositions can such phrases as the following be converted, 'the relation of husband and wife is the keystone of society;' 'the character of that good and great man has been misrepresented'?

The bounds which separate the different parts of speech are not very well defined, and conjunctions have frequently analogies in derivation and use with other parts of speech. They are often formed by combination from other words which are not conjunctions, as 'therefore,' 'because,' 'notwithstanding,' and by a turn of the phrase their place may be frequently supplied by other parts of speech.

Conjunctions differ from prepositions in their mode of affecting the cases of the nouns which they connect with the previous word or phrase. The preposition is said to govern the noun, that it is to determine its case; the conjunction also determines the case of the noun, but in a different manner, it always requires the case of the noun which follows it to be the same as that of the noun which precedes

it; this might be called passive government. The conjunction also affects actively the moods of verbs, though less frequently in English than in other languages. The rule commonly given by grammarians, which is seldom followed even by the best English writers, is, that when the verb following the conjunction expresses both futurity and contingency, the subjunctive mood must be used; when either of these elements is wanting, the indicative.

CONJUNCTION. Two planets, or the sun and a planet, are said to be in conjunction when they have the same longitude. When it is simply said that a planet is *in conjunction*, conjunction with the sun is to be understood. *Superior* conjunction and *inferior* conjunction are terms used of the planets whose orbits are nearer to the sun than that of the earth. These, it is plain, may be in conjunction in two ways, either when the planet is between the earth and the sun, or when the sun is between it and the earth. The former is called inferior and the latter superior conjunction. The mark ☌ is the symbol for conjunction.

CONJURATION, in law, a compact formed by an unlawful oath, a term formerly used, especially in the sense of having personal conference with the devil or some evil spirit to discover secrets or effect some malicious purpose.

CONNAUGHT, one of the four provinces of Ireland, bounded E. and N.E. by Leinster and Ulster, S. by Munster, and N. and W. by the Atlantic. Length, N. to S., 112 miles; breadth, E. to W., 99 miles; area, 4,392,043 ac. Its west coast is much broken up by numerous bays and inlets, and is thickly studded with islands. It is also extremely rugged and mountainous, and abounds in magnificent and picturesque scenery. The central parts are comparatively level, and of limestone formation, while the surrounding mountains are formed of sandstone, clay-slate, granite, and quartz. A large proportion of the province is bog, and, generally, it is the least fertile of all the provinces. In 1872 739,448 acres were under crops of various kinds: 18,112 under wheat; 222,254 under oats; 204,650 under potatoes; 215,568 under clover, &c.; 2894 under flax; and the remainder under green crops, &c. Connaught was formerly a kingdom of the Irish Pentarchy. Its kings were of the race of O'Connor. It is divided into five counties—Galway, Mayo, Roscommon, Leitrim, and Sligo. Pop. in 1871, 845,993.

CONNECTICUT, a river, United States, the west branch of which forms by treaty the boundary between the United States and Canada to lat. 45° N. It rises in the highlands, on the north border of New Hampshire; and after a south by west course of 410 miles through a fine country, and past numerous flourishing towns, during which it forms the boundary between Vermont and New Hampshire, passes through the west part of Massachusetts and the central part of Connecticut, and falls into Long Island Sound. It is navigable to Middleton for vessels drawing 10 feet water, and for vessels drawing 8 feet it is navigable to Hartford, about 40 miles from its mouth. Above this the navigation is impeded by rapids and falls, which, however, may be passed by canals formed alongside the river. By means of small steam tow-boats the river may be navigated by boats of 10 or 12 tons 250 miles above Hartford. The Connecticut is famed for its shad fisheries, but salmon, which were formerly abundant, are no longer to be found in it.

CONNECTICUT, one of the smaller of the Northern United States of America; bounded west by the state of New York, north by Massachusetts, east by Rhode Island, and south by Long Island Sound; length, east to west, about 95 miles; greatest breadth, north to south, about 72 miles; area, 4674 square miles. It contains several distinct ranges of hills, but none of them have any great elevation. Its principal river is the Connecticut, which divides it into two nearly equal parts; the other rivers of any note are the Housatonic and the Thames, both of which are navigable for 12 to 17 miles up their respective streams. The coast is indented with numerous bays and creeks, which furnish many harbours—some of them excellent. Its minerals comprise iron, copper, lead, cobalt, plumbago, marble, freestone, porcelain-clay, and coal. Some of its mountains, particularly Green Mountain range, are supposed to be rich in minerals. The climate is healthy, though subject to extremes of heat and cold; on the sea-coast it is particularly variable. In winter the winds are cold and piercing. The soil is in general good, particularly in some of the valleys, where it is extremely fertile, and very easily tilled. It is, however, on the whole, better suited for grazing than tillage, abounding, as it does, in fine meadows. But where agriculture is practised the soil is well cultivated, and produces ample crops of Indian-corn, rye, wheat, oats, barley, buckwheat, and potatoes, some pumpkins, turnips, pease, beans, &c. Fruits also are cultivated with great success, particularly apples. A large proportion of the farms are fenced with stone walls. Cattle, horses, sheep, butter, and cheese are produced in large quantities. The assessed value of real estate in Connecticut (1870) was $204,110,509; of personal, $221,322,728 (true valuation of both, $532,951,061); total taxation (not national), $6,064,843; public debt, including counties, towns, &c., $9,813,006. The total acreage of improved land is 1,646,752; of woodland, 577,333; value of live-stock, $17,545,038; estimated value of farm products, including betterments and additions to stock, $26,482,150.

The manufactures of Connecticut are considerable; they consist chiefly of woollen and cotton goods, metals, paper, wooden clocks, hats and caps, saddleries and other leather manufactures; potteries, glass-houses, machinery, hardware, cutlery, soap, tallow and wax candles, bricks, gunpowder, carriages, with tanneries, and numerous flour, grist, and saw mills. The exports of Connecticut consist principally of beef, pork, horses, cattle, mules, butter, cheese, Indian-corn, rye, flax-seed, fish, wooden clocks, candles, and soap. The foreign commerce of the state is nearly all carried on through the ports of New York and Boston. There is, however, a considerable coasting trade, some direct traffic with the West Indies, and a large amount of tonnage engaged in the whale and cod fisheries. Fish culture is cared for in Connecticut with remarkable solicitude, especially with the object of introducing into the waters of the state new varieties of well-known and marketable fish. State commissioners of fisheries were appointed in 1866. Their efforts have been particularly directed to salmon. During the summer of 1871 they placed several thousand young salmon in the smaller streams entering into the Housatonic and other rivers, and propose to introduce fry every year till 1875 or 1876, when they confidently anticipate that the true salmon will be permanently colonized in the rivers of the state. (American Annual Encyclopædia.) The railway system of Connecticut is fully developed. The number of miles of railway completed and in actual operation in 1870 was 667, under construction, 250.

The principal religious denominations are Congregationalists, Baptists, Episcopalians, and Methodists. There are five colleges in the state, the principal of which, Yale College, is one of the most richly endowed in the United States. There is a state fund amount-

ing to more than $2,000,000 (£400,000), the interest of which is appropriated to the support of schools. Connecticut is divided into eight counties; and it possesses two capitals, Hartford and Newhaven, in which the legislature meets alternately. The government is vested in a governor, lieutenant-governor, who is president of the senate, and in a senate and house of representatives. The senate consists of not less than eighteen, and not more than twenty-four, members. Most of the towns choose two representatives, some of less population only one. The supreme court consists of five judges, appointed by the legislature, during good behaviour, or until seventy years of age. These judges hold separately a court twice a year in each county, and all the judges together hold one court annually in each county.

The state at first consisted of two colonies—Connecticut, with its seat of government at Hartford; and Newhaven, at Newhaven. The colony of Connecticut was settled in 1633 by emigrants from Massachusetts. Hartford was settled by English in 1635, the Dutch having previously built a fort there. The colony of Newhaven was settled by English in 1638, and the two colonies were united in 1665 by a charter granted by Charles II., which, after an attempt to resume it made by James II. in 1686, continued in force till 1818, when the present constitution was formed. The constitutions of the colony on the banks of the Connecticut of the years 1638 and 1650, and the most ancient record of the colony of Newhaven, possess no little historical interest. The chapter of *capitall lawes* in the code of 1650 is almost verbally copied from the Mosaic law. It inflicts death, among other offences, for blasphemy, adultery, rape, sodomy, stealing; bearing false witness in order to take away another man's life; cursing of parents by a child above sixteen; or on a son who manifests a stubborn and rebellious spirit after having been chastised by his parents, &c. The *plantation covenant*, recorded in the oldest record of the colony of Newhaven, is one of the purest specimens ever afforded of the *contrat social* of Rousseau. Pop. in 1870, 537,454, of whom 527,549 are white, 9668 coloured, 235 Indians, and 2 Chinese.

CONNEMARA ('the Bays of the Ocean'), a district in Ireland, in the county of Galway, occupying its western portion. It is about 30 miles in length, and 15 to 20 miles in breadth. It consists chiefly of mountains and bogs, interspersed with numerous small lakes, presenting some wild and interesting scenery. Its coasts are indented by arms of the sea and bays innumerable. It is subdivided into Connemara Proper in the west, Jar-Connaught in the south, and Joyce Country in the north.

CONON, an Athenian who lived in the latter part of the fifth and the beginning of the fourth century B.C. He had the command of a fleet in 413 to prevent the Corinthians from relieving Syracuse, then at war with Athens. After various other services he was, B.C. 406, made the first of the ten generals chosen to supersede Alcibiades, and retained his command when all his colleagues were deposed. When the Athenian fleet was surprised and Athens captured by Lysander, B.C. 405, Conon escaped with eight ships to Cyprus, where he remained till the war between Sparta and Persia afforded him an opportunity of serving against the enemies of his country. He was appointed to the command of a Persian fleet B.C. 397. Being deficient of supplies he visited the Persian court in 395. His requisitions were complied with, and at his own request the Persian general Pharnabazus was appointed his colleague. In B.C. 394 they defeated the Spartan admiral Pisander off Cnidus. In B.C. 393 Conon returned to Athens to restore the walls and fortifications demolished by the Spartans, in which he made great progress in a short time. When the Spartans opened negotiations with the Persians he was sent by the Athenians to counteract their diplomacy, but was thrown into prison by the Persians. According to some accounts he was sent into the interior of Asia and put to death; according to others, considered more probable, he escaped to Cyprus, but the time of his death is not known.

CONONICUT, an island, United States, Rhode Island, in Narragansett Bay, 8 miles long by 1 broad. On its south end is a lighthouse with a fixed light.

CONQUEST, in feudal law, was a name applied to purchase or any other means of acquiring property than by the common course of inheritance. This usage still prevails in Scotch law, where all the property acquired by a man during his lifetime and transmitted to his heir is called an inheritance by conquest.

CONRAD, the name of three German kings or emperors.—CONRAD I., who reigned from 911 to 918. On the death of Louis IV., the last of the Carlovingian line, he was chosen King of Germany, being then Count of Franconia. He is chiefly remarkable for the revival in his case of the elective title to the crown.—CONRAD II., king of Germany and emperor of the Romans, who was emperor from 1024 to 1039, is regarded as the true founder of the Franconian or Salic line. His election was a very formal act, and took place on the banks of the Rhine, between Mentz and Worms, where eight tribes, and eight dukes with their vassals, are said to have met for the purpose. He was often engaged in contests with the greater barons and princes of the empire, and endeavoured to form a counterpoise to their influence by encouraging the formation of minor independent fiefs. With the same view he endeavoured to appropriate several of the larger duchies to members of his own family, and thus convert the elective empire into a hereditary monarchy similar to that of France. These designs, though conducted with considerable ability, failed, mainly in consequence of the incessant contests in which he was engaged with the popes.—CONRAD III., king of Germany and emperor of the Romans from 1138 to 1152, was the founder of the Suabian dynasty of Hohenstaufen. He had for competitor Henry the Proud. During the struggle arising from their competition the factions of Guelf and Ghibelline, named from the war-cries of the respective parties, came into existence. Conrad, persuaded by the eloquence of St. Bernard, took part in the second crusade, and led an army of 170,000 to the East in 1147. He returned in 1149, bringing with him only some relics of his army. He was succeeded by his nephew Frederick Barbarossa.

CONRAD, FREDERIK WILLEM, born at Delft in 1769, became the pupil and friend of Brünings, who is so much celebrated for the construction of the sea dykes of Holland, and on his death succeeded him in his situation of inspector-general of sea dykes in the province of Rynland. He afterwards held the office of administrator-general of the sea dykes in the Low Countries, and died in 1808. He rendered a lasting service to his country by reclaiming large tracts of land from the sea, and more especially by the formation of a proper outlet for the waters of the Rhine.

CONRADIN OF SUABIA, the last of the imperial house of the Hohenstaufen, son of the Emperor Conrad IV., from whom he inherited Naples and Sicily in 1254. Pope Clement IV. would not acknowledge him, because he was the son of a prince who died in excommunication, and therefore conferred Sicily on Charles of Anjou, brother to Louis IX. (St. Louis), King of France. As the administration of Charles occasioned great dissatisfaction, the people

called in *Conradino*, as he was termed by the Italians. He came accompanied by his friend Frederic, prince of Baden, with about 10,000 men, in 1267, when he assumed the title of King of the Two Sicilies. At first fortune seemed to favour him; in 1268 he entered Rome at the head of his army; but at Tagliacozzo he was defeated, and on his flight betrayed by Frangipani, and taken prisoner with his friend. Charles of Anjou, with the consent of the pope, ordered them to be beheaded, October 25, 1268, in the market-place of Naples. Conradin was but sixteen years old. He died with admirable firmness, after having declared his relation, Peter of Arragon, the heir of his realm. According to the popular account, he threw his glove into the crowd, which was carried to Peter of Arragon, who afterwards avenged him. Peter gained possession of Sicily in 1282, when the Sicilian Vespers put an end to the French power in that island. It is supposed that a German poem, a *Minnelied*, or love-song, the second in the Manessian collection, and bearing the name of King Conrad, was composed by him.

CONRING, HERMANN, one of the greatest scholars of his time, was born at Norden, in East Friesland, in 1606. He survived an attack of the plague, and afterwards studied at Helmstädt and Leyden, devoting himself chiefly to theology and medicine; was appointed, in 1632, professor of philosophy at Helmstädt, in 1636 professor of medicine, and remained in this city until his death in 1681. He was distinguished in almost every department of knowledge, and was invited, in 1649, by the Princess of East Friesland to be her physician. In 1650 he received a similar invitation from Christina, queen of Sweden, and in 1664 a pension from Louis XIV. At a later period the title of a counsellor was conferred on him by the Kings of Denmark and Sweden and the Elector of the Palatinate. He was then made professor of law. The German emperor likewise distinguished him. From far and near his advice was sought in political and legal cases. He did a great deal for the history of the German Empire, and for the improvement of German public law, in which he opened a new path. He wrote, it is true, no new system or compendium, but many treatises on particular subjects, highly serviceable for others, and educated many celebrated scholars. His works are said to have amounted to 120. Such were his acquirements, and his confidence in his ability to apply them, that he is said, on offering his hand to a lady, to have asked her whether she would like to have him a theologian, jurist, diplomatist, or physician. His works, with his biography, were published in 1730, at Brunswick, six volumes, folio, by Göbel. They contain political, historical, medical, philosophical, juridical, &c., treatises, besides letters and poems.

CONSALVI, ERCOLE, cardinal and prime minister of Pope Pius VII., was born in 1757 at Toscanella. His views on the French revolution, publicly expressed, gained him the favour of the aunts of Louis XVI., and through the influence of these ladies he became auditor of the *rota* at Rome in 1792. In this capacity he was charged to have an eye upon the friends of the French, which he did with great strictness, and on this account was banished when the French entered Rome in 1798. He afterwards became secretary of Cardinal Chiaramonti, and when his patron was elected pope (Pius VII.), became one of the first cardinals, and afterwards secretary of state. Consalvi was the person who concluded the famous concordat with Napoleon in 1801. In 1806 he gave up his office, and for several years after lived, like his master, in a kind of retirement. In 1814 he became Papal minister at the Congress of Vienna, where he effected the restoration of the marks and legations to the pope. In 1815 he conducted the negotiations with France; at the same time he drew up the celebrated edict 'motu proprio.' Until the death of Pius VII. he remained at the head of all the political and ecclesiastical affairs of the Roman government, and possessed the fullest confidence of the pope. He gave a large sum to erect a monument to his master, and died in Rome Jan. 24, 1824.

CONSANGUINITY is the relation of persons descended from the same ancestor. It is either lineal or collateral. Consanguinity is lineal between father and son, grandfather and grandson, and all persons in the direct line of ancestry and descent from one another. It is collateral between brothers, cousins, and other kinsmen descended from a common ancestor, but not from one another.

CONSCRIPTION, the enlisting (*enrôlement*, in French) of the inhabitants of a country capable of bearing arms, by a compulsory levy, at the pleasure of the government. It is distinguished from *recruiting*, or voluntary enlistment. The name is derived from the military constitution of ancient Rome. Every Roman citizen was obliged to serve as a soldier from his seventeenth to his forty-fifth year; hence no *recruiting*, in the modern sense of the word, took place, but only levying (*delectus*). According to law, four legions of infantry, two for each consul, were annually levied. The consuls, who in the time of the republic were always commanders of the army, announced every year, after the legionary tribunes were elected, by a herald or a written order, that a levy was to be made (*milites cogere, colligere, scribere, conscribere*). This was the proper conscription. All citizens capable of bearing arms were obliged, under penalty of losing their fortune and liberty, to assemble in the Campus Martius, or near the capitol, where the consuls, seated in their curule chairs, made the levy by the assistance of the legionary tribunes. The consuls ordered such as they pleased to be cited out of each tribe, and every one was obliged to answer to his name, after which as many were chosen as were wanted. This lasted until the time of the emperors, when large armies were constantly required: these were generally recruited in the provinces. The word conscription was introduced into the French language as well as the system into France, by the law of 19th Fructidor, year VI. (5th Sept. 1798), which declared that every Frenchman was a soldier, and bound to defend the country when in danger. Excepting in times of danger it provided that the army should be formed by voluntary enrolment or by *conscription*. The number of conscripts to be called into the service each year was to be determined by the Corps Législatif. The conscription included all Frenchmen from twenty years of age complete to twenty-five years complete. The conscripts were divided into five classes by the number of the completed years of their age. They could only be struck off the list on being officially found incompetent for service. Each conscript not in active service was discharged on completing his twenty-fifth year. In time of peace all conscripts were discharged absolutely at this age. The first class, that is from twenty to twenty-one, were first called out; the second were only called out when all the first were in active service, and so on. When the required number was made up, the name and surname of the last conscript on the list, his canton and department, the year, the month, and the day of his birth were published by proclamation throughout the republic. By this proclamation all conscripts up to this age were notified to join the colours. At first the conscripts of the first class were found sufficient, and complaints of the conscription did not begin till 1802, on the introduction of a principle of indemnity, by which a payment ranging from 50 to 1200 francs (£2 to £48), ac-

cording to the annual taxation of the parents of the conscript, secured him exemption. By 1804 the increasing demands of the conscription had so greatly augmented the number of refractory conscripts as to call for the serious attention of the legislature. The conscription was amended by the law of 8th Fructidor, year XIII (26th Aug. 1805). The principle of selecting the conscripts by lot was then introduced, the only sons of widows and those whose brothers were in the army were exempted. This law also admitted substitution, which had previously been practised by connivance. Although drawing by lot was established the classes were maintained, and an individual who was drawn one year, and paid for a substitute, could be drawn again the next. The levies were always large under the empire. For the last fifteen months (Sept. 1812 to Nov. 1813) they reached the enormous number of 1,260,000. At the time when the first of these great levies commenced the number of refractories was already estimated at over 250,000 without reckoning fourteen departments in the west which had ceased to enforce the conscription. The conscription was attended with gross abuses in the matter of exemption and substitution. It was chiefly in consequence of these abuses that on the restoration of the Bourbons conscription was abolished by the 12th art. of the Charte Constitutionelle. It was, however, re-enacted in its substantial features by the law of Marshal Gouvion de St. Cyr, and continued through the Revolution of 1848 and the Second Empire to form the mode of recruitment in France. Under the monarchy the demands of the conscription were comparatively light, and the abuses few. The wars of the Second Empire made the demands much heavier, and the old abuses in exemption and substitution reappeared. In the intervals of peace, while the army was kept up to a war footing, particularly in the latter part of the reign of Napoleon III., these abuses assumed the most venal form. The ranks of the army were filled up on paper, while officials of various ranks pocketed the price of substitutes instead of providing them. On the outbreak of the Franco-German war the hollow machine which had thus been gradually taking the place of an army on a war footing collapsed, and involved in its fall the ruin of the empire. A new army-bill, promoted by the government of M. Thiers, was passed by the National Assembly with several amendments in July, 1872. This act affirms the universal liability to conscription, but allows certain exceptions and postponements. The term of service is fixed at five years for a portion of the conscription, and six months for the remainder. By an amendment introduced by M. Dupanloup, archbishop of Paris, the free exercise of religion is allowed to all the service.

The Prussian military system was indirectly the work of Napoleon. By the Treaty of Tilsit in 1807 he obliged Prussia to undertake during the next ten years not to keep on foot more than 42,000 men. This obliged Scharnhorst, to whom the re-organization of the army was committed, to adopt the principle of frequent levies and a short period of training and enlistment, which he carried out with so much success that in 1813 Prussia was able to take her place again as a first-class power. The Prussian military system is now extended generally to the German Empire. Its terms in regard to conscription are obligatory service for all subjects; the total length of the service is twelve years, three in the active army, four in the reserve, and five in the landwehr. The annual contingent is about 130,000. The age of service begins with the 1st of January of the year in which the conscript completes his twentieth year. The reserve and landwehr are called out for service only in time of war. All those who are capable of bearing arms between the ages of seventeen and twenty, and between the ages of thirty-two and forty-two, belong to the landsturm, which is only called out on great emergencies, on the command of the imperial general.

Most of the countries of Europe have a period of compulsory military service. The army of Russia is in process of re-organization. The land forces are to be divided into troops of the line and local forces; in time of war reserve forces, and in extreme cases a national militia are to be formed. The troops of the line are to be formed as formerly by levies ordered by the state. Substitution and exemptions are admitted. An exemption costs at present 570 rubles (£71). The local troops are to receive an entirely new organization. They are, in time of peace, to constitute the nucleus of a military organization, to occupy themselves with the interior service, the instruction of recruits, and the calling together for short periods of the reserve. This plan will give the army a peace footing of upwards of 730,000 men, exclusive of officers, under arms, and this number will have to be provided for by conscription.

The Austrian army is regulated by the law of 5th December, 1868, which renders military service obligatory on all citizens. The duration of service in the line is three years, in the reserve seven years, in the landwehr two years.

In Great Britain and the United States of America a small militia obtained, if necessary, by conscription is usually kept up in time of peace, but the regular army and navy are recruited by voluntary enlistment. In Great Britain volunteer recruitment is commonly found to be sufficient to raise the contingents for the militia required from the separate counties.

CONSECRATION, the action by which a thing, animal, or person is destined for the service of God or of the deities of paganism. It is opposed to *profanation* and *sacrilege*. With the Romans, *consecratio* at first signified only *dedication;* but under the emperors it denoted *deification*. (See APOTHEOSIS.) The Greek and Roman Catholic churches practise the consecration of things and persons, and ground the usage on numerous passages in the Old Testament and several in the New. (For the consecration of priests, see PRIESTS.) In a narrower sense, the word *consecration* is particularly used for the act of the priest who celebrates the mass, by which he is considered as changing the bread and wine into the real body and blood of Christ. There was formely a warm contest between the Greek and Roman Catholic churches on this subject; the former maintaining that, in the consecration of the elements, it was necessary not only to use the words of Christ, but to invoke the Holy Spirit; while the latter denied that any such invocation was required. At present the Greeks themselves are divided on this point. The Protestants do not generally consider consecration so important as these two churches do. The consecration of the pope is a ceremony which takes place immediately after his election.

CONSENT, in law, is understood to be a free and deliberate act of a rational being. Any voluntary act by which the agent takes away his own power of giving a deliberate consent, such as partial intoxication, will not invalidate the consent; but it is invalidated by any undue means—intimidation, improper influence, or imposition—used to obtain it. The law does not, in general, take cognizance of the wisdom or folly of men in entering into contracts before it enforces them; but where clear proof can be brought that a person has been wilfully misled or entrapped into a contract, it will refuse to enforce it.

CONSEQUENTIAL DAMAGES, in law, are losses incurred in consequence of an act, but not flowing directly from it. The liability for consequential

damages resulting even from an unlawful act is more limited than that for direct damages, as it is evident that the power of the law in tracing and enforcing such damages must be limited; but in some cases they can be enforced.

CONSERVATORY (Italian, *conservatorio*), a name given by the Italians to a systematic school of musical instruction. The term is applied in France to other schools besides those of music. There is in Paris a *Conservatoire des Arts et Métiers.* When the word is used alone in French, however, as in Italian, it applies to a musical school. The word conservatorium is used in the same sense in Germany. In this country the term is usually applied to foreign schools of music. Conservatories were originally benevolent establishments attached to hospitals, or other charitable or religious institutions. In Naples there were formerly three conservatories for boys; in Venice four for girls. The most famous among the former was that of *Santa Maria Loretto*, established in 1537. From these conservatories issued many composers and the greater number of the male and female singers, who were met in every part of Europe. In Naples the conservatories were reduced to a single establishment, which in 1818 was removed to the former nunnery of St. Sebastiano, and received the name *Real Collegio di Musica.* In Milan the Viceroy Eugene established a conservatory in 1808, the direction of which was given to Asioli. It had fourteen professors and sixty pupils. In France music was very little cultivated until Italian and German music were introduced by Piccini, Sacchini, Gluck, and others. The want of singers was now felt. The opera therefore established a musical school, and in 1784 it was elevated into an *École Royale de Chant et de Déclamation.* But it was not until the revolution that this institution acquired a high degree of importance. The want of musicians for fourteen armies was then felt, and in November, 1793, the Convention decreed an *Institut National de Musique.* In 1795 it received its final organization, and the name of *Conservatoire de Musique.* The most distinguished musicians have been instructors in this institution; of whom we need only mention Gossec, Méhul, Garat, Choron, Cherubini, Grétry, Boieldieu, Kreutzer, &c. The Conservatorium, founded at Leipzig in 1842 under the auspices of Mendelssohn, is the most influential in Germany, both from the excellence of its teachers and the musical celebrity of the city. A musical school, established at Cologne in 1849 by Hiller, is very prosperous. Institutions of the same description exist in Warsaw, Prague, Munich, Berlin, and Vienna. For almost all branches of music the French *conservatoire* has published elementary works, or *méthodes*, as they are called, which are circulated and adopted throughout Europe. The

Conservatoire National des Arts et Métiers, at Paris, is a magnificent establishment situated in the Rue St. Martin in Paris, on the site of the old Abbey of St. Martin-des-Champs, and contains models of improved tools, new machines, instruments and apparatus useful in agriculture, manufactures, and other branches of industry. The institution originated in the private collection of Jacques de Vaucanson, a celebrated mechanician, who died in 1782. During his life he threw open his establishment at the Hôtel de Mortagne to the public for the instruction of working-men, and at his death bequeathed it to the government. Under the administration of M. Vandermonde it acquired, between 1785 and 1792, more than 500 new machines. This collection had become scattered through various buildings, when, on the 19th Vendémiaire, an III (Oct. 10, 1794), the National Convention decreed the formation, under the title of Conservatoire des Arts et Métiers, of a depôt of machines, models, descriptions, and books in all kinds of arts and trades, in which patterns of all new and improved machines should be deposited, and instruction given in the construction and use of tools and machines used in arts and manufactures. Arrangements were likewise made for carrying out these objects, and for disseminating instruction by means of the institution throughout France. The conservatoire is under the direction of the minister of agriculture, commerce, and public works. It gives public gratuitous instruction in the evenings on descriptive and applied geometry, chemistry, agriculture, and various branches of technical instruction in arts, manufactures, &c. Its professors have at their command a vast laboratory, richly provided for all manner of experiments in science and art.

CONSERVATORY, in gardening, is a term generally applied by gardeners to plant-houses, in which the plants are raised in a bed or border without the use of pots. They are sometimes placed in the pleasure-ground along with the other hot-houses, but more frequently attached to the mansion. The principles of their construction are in all respects the same as for the greenhouse, with the single difference that the plants are in the free soil, and grow from the floor instead of being in pots placed on shelves or stages. The power of admitting abundance of air, both by the sides and roof, is highly requisite both for the greenhouse and conservatory; but for the latter it is desirable in almost every case that the roof, and even the glazed sides, should be removable in summer. When the construction of the conservatory does not admit of this, the plants in a few years become etiolated and naked below, and are no longer objects of beauty; but when the whole superstructure, excepting the north side, is removed during summer, the influence of the rains, winds, dews, and the direct rays of the sun, produces a bushiness of form, closeness of foliage, and a vividness of colour not attainable by any other means. Therefore a conservatory of any of the common forms, unless it be one devoted entirely to palms, ferns, *Scitamineæ*, or other similarly growing plants, should always be so constructed as to admit of taking off the sashes of the roof and the front; and if it be a detached structure in the flower-garden, a plan that would admit of the removal of everything excepting the flues and the plants would be the most suitable.

CONSIGNMENT is a mercantile term used in two related senses, and means either the sending of goods to a factor or agent for sale, or the goods so sent. The terms consigning and consignment are chiefly used in relation to foreign trade, and are distinguished from two other modes of conducting an international business. The one of these is when the foreign dealer comes to the producing market and purchases what he wants; the other when a merchant belonging to a producing country opens an establishment in a foreign market for the interchange of the products of that market with his own. In this case the establishment opened abroad is identical in interest with the home one from which it draws its supplies. It may be managed by partners of the home establishment or by clerks, and the relation between the two will be that of copartnery or service —not that of agent and principal. Consigning in the proper sense is a kind of parasitical method following and depending on one or other of the two modes, more particularly the latter.

When foreign business is restricted to the purchase of goods in the producing market by foreign dealers or their agents, it is always on the most restricted scale. This is a state of things which a country capable of producing goods on a large scale for foreign consumption never can long endure. Sometimes the

producers, when their foreign customers fail to offer for their goods, may make them their agents, and send goods to them for sale on their own account. More frequently the country whose production is in the aggressive stage sends out agents to the countries with which it wishes to deal, and pushes its trade with all the appliances of an aggressive agency. This branch of business is conducted distinctly from the actual production of goods, and culminates in the formation of mercantile establishments such as we have described, which, from their constant communication with each other, and their facilities for ascertaining the wants of each market, tend greatly to extend the limits of foreign trade.

There is yet, however, a further expansion to be reached, and this is effected by means of consigning business. The mercantile houses established for conducting the foreign trade are, as has been observed, independent of the producers. In purchasing goods for shipment to their foreign houses they find certain articles more easy to deal with, and more remunerative than others. These may vary according to the particular market, but they are in general the goods which are in largest demand, which are most valuable in proportion to their bulk, and which are least liable to accident or deterioration. The goods in largest demand in the market are called the staples of the market. Merchants have a natural preference for goods of this kind; they are those which they ship most freely, and press most eagerly upon foreign markets. There are other goods of an opposite character in which they deal with comparative reluctance, and often make a point of avoiding altogether. They are bulky, of little value, and easily spoiled. There are persons, however, who have a stronger interest than the merchants in shipping these goods: for weighty and bulky goods there are the ship-owners, for all kinds the producers. The houses opened by the merchants afford facilities for these parties becoming shippers as consigners. The interest of the ship-owners is casual. It may frequently happen that they have to despatch their vessels without sufficient cargo; in this case a shipment on their own account of weighty or bulky goods of little value, according to the nature of the deficiency, will afford them a chance at little risk of earning, if not a full freight, at least some return for the vacant room. The interest of producers is more permanent. A brewer, a potter, or a glass manufacturer, has a much smaller chance than many other manufacturers to get merchants to ship their goods freely to foreign ports, but he can easily find agents there to sell them for him on his own account. Hence these, and many other manufacturers, when favourably situated for shipping systematically, become consigners on their own account.

All these are legitimate developments of trade, but others remain which are less normal and of more doubtful advantage. Consigning business is found to be very profitable to the agents, and they naturally do all they can to encourage it. The commissions on foreign consignments are large: besides a selling-commission, there is usually a commission for guaranteeing sales on credit, frequently another for guaranteeing returns made in bills, or for purchasing produce as a return for consignments. There are besides the commissions numerous charges on which a profit can be made. The receivers of consignments are obliged to keep magazines and stores, for the use of which their consigners are charged; and as this is an outlay of capital, it is reasonable that the charge for storage should be calculated at a profitable rate, and so with other charges involving outlay. When the profits of a consigning agency are contrasted with the occasionally larger but much less safe profits of original ventures, they are frequently found to compare favourably. Hence many houses directly engaged in foreign commerce encourage consignments as far as they can; some, after beginning as merchants, entirely abandon the purchasing in favour of the agency business; and others, when a consigning business is developed, are opened solely for the purpose of cultivating it.

Houses which have their head-quarters in the exporting market have much greater advantages for cultivating a consigning connection than purely foreign houses. The latter are distant, and apt to be forgotten; and if they employ agents to canvass for them, these do not inspire the same confidence as resident partners. But the great advantage of the home houses is in regard to financial arrangements. If a consigner ships to a foreign house he must, as a rule, lie out of the whole value of his shipment till he receives the returns for it. This limits his shipments to the amount of his spare capital, and makes it impossible for any one except of large means to make consigning a regular business. This difficulty is got over by the home houses by means of an arrangement called advancing.

When a house in the shipping market to whom a consignment is offered is satisfied to accept it for one of their foreign correspondents, they frequently agree to make an immediate advance to the shipper of part of the value of his consignment. This does not necessarily or usually involve any outlay on the part of the house making the advance. The shipper draws a bill upon them for the amount of the advance agreed upon, discounts it with his own banker, and applies the proceeds to the purposes of his business. When the bill is due, if the returns for the consignment have not been received it is renewed, that is, a new one of the same amount is drawn and discounted to pay the old; and this may be repeated again and again till the consignment is sold, and the proceeds applied to pay off the advance. If there is any surplus, it belongs to the shipper; if there is a deficiency, he is bound to make it good.

This arrangement encourages consigning business in a variety of ways. It enables manufacturers of moderate means to engage in it as a systematic business without a disproportionate outlay, or perhaps without any outlay at all. In estimating the proportion which it is safe to advance, the consignee has regard to the market value of the goods; but as a producer expects a profit when goods are sold, he may have the full cost of his goods, although he receives considerably less than the market price. Frequently he receives much more than the full cost, and consigning becomes a financial expedient for relieving difficulties already encountered. Merchants or agents who are in the habit of receiving consignments of all kinds of goods cannot be perfectly competent judges of them all. Besides, in most goods there are varieties of quality which render market-prices an unsafe criterion. The consignee is thus obliged, in making advances, to trust to the honour of the shipper, which, when it is unimpeachable, is his safest guarantee. But it is not always so; and in many cases a practice may be adopted with impunity which is called *salting invoices*, that is, giving as the market value of the goods a price so much above it that the shipper receives as the advance upon his goods either the full market value or considerably above it. It matters little, when this course is adopted, whether the consignee advances three-fourths, two-thirds, or one-half of the invoice value, as the shipper can generally adjust matters to make the advance suit himself.

The temptation to over-shipping thus presented is not limited to manufacturers. There are those who

covet the profits of the merchant as well as of the producer, and advances, whether legitimate or illegitimate, extend the number of those who are in a position to compete for them. It is clear that the man who buys goods in the open market to consign them to a foreign house in whose profits he is not interested labours at a great disadvantage. All the parties we have yet named have a special hold on the foreign trade. The purchaser who ships to his own house abroad saves the commissions and extra charges paid by the consigner, and these constitute a profit to him. The ship-owner ships to earn a freight, not to make a profit on the goods. The manufacturer who ships his own goods, although he pays the commissions of the foreign house is remunerated if he receives the market value of his goods, which would be only the cost price of a purchaser. But the purchaser who pays both the market price of the goods and the commissions of the consignee must have a clear profit above the price which would satisfy any of these shippers before he receives any remuneration at all. To any one who knows how profits are regulated by competition this simply means that normally there is no place in the foreign trade for the purchasing consigner at all, and that on the average of the transactions this class must make a loss and not a profit. Notwithstanding this there are frequent opportunities when men of superior information and shrewdness may make a profit, and the temptations of a speculative business, together with the facilities of advancing, have, especially in certain epochs of foreign trade, extended the transactions of this class in an extraordinary degree. One of these epochs was the gold discoveries of Australia. It is matter of history that the sudden demand which sprung up for European goods, in consequence of the influx of colonists caused by this event, was so over-supplied, that the markets of Melbourne and other Australian ports groaned for long after under the weight of productions of this country of all kinds, which were literally going to waste, or selling for less than their original cost. Even in normal times no one unacquainted with the details of foreign trade could imagine how long and persistently goods will continue to be pressed on a declining market before the shippers connected with all the rival systems we have described come to be satisfied that there is no longer a profit to be made on them.

The system of advancing affects different markets differently according to the nature of the banking facilities they may enjoy, and other circumstances. It was for a considerable period more characteristic of Scotch than of English manufactures, and Glasgow in particular may be said to have presented some of the largest developments of the trade. This was due to two leading causes. Glasgow at the time to which we refer did not hold out such strong attractions to foreign buyers as the principal English manufacturing towns, particularly as it lay somewhat out of their route. Such buyers were certain to visit Manchester, Sheffield, Birmingham, Halifax, &c., according to the particular direction of their trade; while Glasgow, which competed with all these towns, was less likely to secure a visit than any of them. It had therefore to compete more keenly for a share of the foreign trade to get what its manufacturing facilities could otherwise enable it to command. This the superior facilities afforded by the Scotch banks enabled it to do, greatly to the advantage of Scotch commerce, but there is no doubt that in time the system was abused. The difference between Scotch and English producers in respect to consigning is now less marked. The commanding position now attained by Glasgow has made her manufacturers more independent of it, and at the same time the greater stringency of the Scotch banks, and the increasing number and liberality of the English ones, have tended to equalize the facilities for consigning.

The consigning trade is protected by special laws. In most countries a consigner can claim his goods and collect all outstanding debts for goods sold on his account by a consignee who has suspended payment.

CONSISTORY (from the Latin *consistorium*). This word has been handed down from the time of the Roman emperors, particularly from the time of the Emperor Hadrian, who died A.D. 138. The emperors had a college of councillors (*consistoriani*) about them, who were obliged to be always together (*consistere*) in order to determine the cases which were brought before the emperor. The council was called *consistorium sacrum*, or *consistorium principum*. When the Roman hierarchy had become firmly established, and the bishops had acquired jurisdiction in many cases, they imitated the institutions and names appertaining to the secular power. Thus, down to the present time the highest council of state in the Papal government has been called *consistory*. The ordinary consistory of the pope assembles every week in the Papal palace; the extraordinary consistories are called together by the pope, according as occasions arise for regulating anew the affairs of the church. These are called *secret consistories*. All political affairs of importance are transacted in the consistory. Also in Protestant countries, on the European continent, consistories exist, which manage the affairs of the church as far as the monarch, their secular head, allows them. In Russia they are little more than the executive officers of the minister, through whom he manages the concerns of schools and churches. In Vienna, and in Paris likewise, Protestant consistories exist, which are the highest Protestant ecclesiastical bodies in those countries.

CONSOLE, in architecture, a projecting ornament or bracket having for its contour generally a curve of contrary flexure. It is employed to support a cornice, bust, vase, or the like, but is frequently used merely as an ornament.

CONSOLIDATED FUND. This fund, which now receives the produce of nearly all the taxes and other sources of revenue of Great Britain and Ireland, was formed in 1787 by the union of certain separate funds by Act 27 Geo. III. cap. xiii. On the union of the exchequers of Great Britain and Ireland, in 1816, the fund was augmented with the separate revenue of the Irish exchequer, and the charges hitherto made upon that exchequer were thrown upon it. The fund is liable from time to time to have specific charges thrown upon it by Parliament; it is pledged for the payment of the interest of the whole of the national debt of Great Britain and Ireland, and after defraying the specific charges assigned to it, the surplus is applied indiscriminately under the direction of Parliament to the public service. The stated charges upon the consolidated fund, besides the national debt, are the civil list, pensions, annuities, salaries, courts of justice, and miscellaneous charges.

CONSOLS, or CONSOLIDATED ANNUITIES, a public stock forming the greater portion of the national debt of Great Britain. It was formed in 1751 by an act consolidating several separate stocks bearing interest at 3 per cent. into one general stock. At the period when the consolidation took place, the principal of the funds united amounted to £9,137,821; but through the addition of other loans it has increased so much that in 1872, after considerable reductions, it still amounted to £395,883,673, more than half of the national debt. The interest of £5,144,836 is payable in Dublin, that of the remainder in London.

CONSONANCE, in music, is the effect of two or more sounds heard at the same time, which satisfies the ear. The effect of a consonance seems to depend on the simplicity of the ratios of vibration of the chords sounding together. All intervals are considered consonant which can be expressed by the ratios of numbers from 1 to 6; those requiring higher numbers to express them are termed dissonant. Consonances having two forms (major and minor), as the third and sixth, are called *imperfect;* those having only one form, as the fifth and octave, are called *perfect.* See CONCORD.

CONSONANT. See ALPHABET.

CONSPIRACY, in law, is an offence ranked as a misdemeanour, and punishable by imprisonment and hard labour. It is constituted by a combination between several persons to carry into effect any purpose injurious either to individuals, particular classes, or the community at large. When the conspiracy is against the public, and leads to any overt act of an unlawful kind, the offence becomes felony.

CONSTABLE (French, *connétable,* from the Latin *comes stabuli,* count of the stable). This office originated as early as the Roman emperors, and passed into the constitution of the Franks. After the *major domus,* or mayor of the palace, had become king, the *comes stabuli* became the first dignitary of the crown, the commander-in-chief of the armies, and the highest judge in military affairs. Under the last kings of the house of Valois, the *connétable* was of so much political influence, that Louis XIII., after the death of the Connétable de Lesdiguières, thought it best not to appoint a new one; and in 1627 he abolished the office entirely. Napoleon re-established it as one of the high offices of the empire, but it vanished with his downfall. In England there was formerly a lord high constable of England, an officer of the crown of the highest dignity. The office of constable appears to have been first granted by William the Conqueror to Walter, earl of Gloucester; or, according to some, to William Fitzosborne, or Roger de Mortimer, and became hereditary in two different families, as annexed to the earldom of Hereford. After two centuries Edward Stafford, duke of Buckingham, then constable, being attainted of high treason, the office was forfeited to the crown (13 Henry VIII.); since which time lord high constables have been appointed only to officiate at coronations, and on other solemn occasions. There is also the constable of the hundred, or high chief, or head constable, probably sprung from this office, and the constable of the village, or petty constable. The first statute which appears to notice the constable is 13 Edward I. ch. vi., wherein 'it is ordained that in every hundred, or franchise, there shall be chosen two constables, to make view of armour,' &c.; since which period, the office has been familiarly known in law, and various duties have been imposed upon it by different statutes. The high constables are chosen at the leet or tourn of the hundred, or by justices of the peace; the appointment of petty constables is specially provided for by 5 and 6 Vict. c. cix., amended by 13 and 14 Vict. c. xx. The duties of constables are multifarious, but may be summed up under two heads—repressing felonies, and keeping the peace, of which they are the conservators by the common law; they are also bound to execute the precepts of sheriffs, justices of the peace, and coroners. In the United States, constables are town or city officers of the peace, with powers similar to those possessed by the constables of Great Britain. They are invested also with powers to execute civil as well as criminal process, and to levy executions.

CONSTABLE, ARCHIBALD, an extensive Scottish bookseller and publisher, was the son of an overseer or land-steward on the estate of the Earl of Kellie, in Fifeshire, and born there in 1774. After receiving an ordinary education, he was apprenticed in 1788 to Mr. Peter Hill, bookseller in Edinburgh, and early displayed a taste for collecting old, rare, and curious books. After the close of his apprenticeship he married the daughter of Mr. Willison, printer in Edinburgh, and established himself as a bookseller in a small shop in the High Street, from which afterwards emanated the Edinburgh Review, the poems of Sir Walter Scott, the Waverley Novels, the Supplement to the Encyclopædia Britannica, and many other valuable works, which have intimately connected his name with the literature of his country. In 1810 he himself edited and published a Chronicle of Fife, from an old diary, and in 1822 he wrote a Memoir of George Heriot, illustrative of The Fortunes of Nigel. In 1823 he removed his establishment from the High Street to a more modern part of the city; but had not been long there before the public was surprised by the announcement of the bankruptcy of his house. This unexpected and lamentable occurrence involved Sir Walter Scott, as is well known, in overwhelming debts, and his life was sacrificed in gigantic efforts to overcome them. How a bookseller, many of whose speculations were so pre-eminently successful, should so far miscalculate his business as to end in such fatal bankruptcy, has never been very well explained; but much has been attributed to an original want of capital, and great personal extravagance, which kept him always behind the world, and obliged him often to make wasteful sacrifices in order to fulfil his engagements. To redeem his fortunes he projected the well-known series of publications, issued under the name of Constable's Miscellany, which has been the precursor of numerous other works of a similar character. He did not long survive his misfortunes, as he died on the 21st of July, 1827. Notwithstanding the unfortunate result of Mr. Constable's business, it cannot be denied that he did much for the literature of his country, by his readiness in appreciating literary merit, his liberality in rewarding it, and the sagacity he displayed in bringing it in an acceptable manner before the public. In the introduction to the Fortunes of Nigel he is commended as one 'whose vigorous intellect and liberal ideas had not only rendered his native country the mart of her own literature, but established there a court of letters which commanded respect even from those most inclined to dissent from many of its canons.'

CONSTABLE, JOHN, a distinguished landscape-painter, was born at East Bergholt, in Suffolk, in 1776. His father was a wealthy miller, and was at first desirous that his son should enter the church, and then, on finding him disinclined to this career, proposed that he should follow his own business. At the latter employment he continued for several years, but his favourite pursuit was painting, and in this he used to occupy his leisure hours. After considerable objection on the part of his father, he entered as a student of the Royal Academy in 1799. For many years his progress as an artist was extremely slow, and it was not till 1814, twelve years after he had begun to send pictures to the exhibition, that he succeeded in getting any of them sold. In 1819 his View on the River Stour attracted much attention, and procured him admission as an associate of the Academy. From this period his reputation widely extended itself, both over Britain and the Continent, and for some of his works exhibited at the Louvre he received a gold medal from the King of France. He died on 30th March, 1837. Constable's pictures are remarkable for the truth and vividness with which country scenes and natural phenomena are repre-

sented. Fuseli said of them that they made him call for his umbrella; and a French critic declared that his leaves and grass were bespangled with morning dew. Among the finest of his works are A View of Salisbury Cathedral, The Cornfield, The Lock, and The Valley Farm. A memoir of him by C. R. Leslie was published in 1842.

CONSTANCE, or KONSTANZ, capital of the Seekreis (Circle of the Lake, or Circle of Constance), in the grand-duchy of Baden, on the south bank of the Lake of Constance, on the narrow passage uniting the lake with its arm the Untersee. The city and its two suburbs, connected with the opposite shore of the lake by an iron bridge, are partially fortified, and very extensive, considering the small number of inhabitants (8516). The fortifications being in the old style give the town at once an antique and interesting appearance. Nor is this effect lessened by a nearer inspection, many of the houses being of the 15th century, and remaining unaltered. The ancient episcopal residence and the cathedral contain beautiful monuments of Gothic architecture.

CONSTANCE, COUNCIL OF, a general council of the Church of Rome, held between 1414 and 1418. The German emperor, the pope, 26 princes, 140 counts, more than 20 cardinals, 7 patriarchs, 20 archbishops, 91 bishops, 600 other clerical dignitaries and doctors, and about 4000 priests, were present at this ecclesiastical assembly, which was occasioned by the divisions and contests about the affairs of the church. After the death of Gregory XI. the French and Italian cardinals could not agree upon a successor, and so each party chose its own candidate. This led to a schism which lasted forty years. Indeed, when the Emperor Sigismund ascended the throne, in 1411, there were three popes, each of whom had anathematized the two others. To put an end to these disorders, and to stop the diffusion of the doctrines of Huss, Sigismund went in person to Italy, France, Spain, and England, and (as the Emperor Maximilian I. used to say in jest) performing the part of the beadle of the Roman Empire, summoned a general council. The pretended heresies of Wickliffe and Huss were here condemned, and the latter was burned July 6, 1415; and his friend and companion, Jerome of Prague, met the same cruel fate May 30, 1416. After the ecclesiastical dignitaries supposed they had sufficiently checked the progress of heresy by these executions they proceeded to depose the three popes—John XXII. (also called *XXIII.*), Gregory XII., and Benedict XIII. John, who was present at the council, was forced to consent to his own removal. He escaped, indeed, with the aid of Frederic, duke of Austria, who was excommunicated and put under the ban of the empire for rendering him assistance, and also lost a large part of his territory. But Frederic at last yielded, delivered John up to the council, and allowed him to be imprisoned. The former pope now gladly received the humbler office of a cardinal. Gregory XII. experienced a similar loss of dignity. Benedict XIII., in Spain, retained for some time the name of pope, but was little noticed. Martin V., on the contrary, was legally chosen to the chair of St. Peter. Sigismund now thought a complete reformation might be effected in the affairs of the church; but the new pope having retired to Italy against the emperor's will the assembly was dissolved, and his object was not attained. It was first accomplished at the Council of Basel. Travellers are still shown the hall where the council assembled (now occupied as a market-house); the chairs on which sat the emperor and the pope; the house where Huss was apprehended, and where his bust is still to be seen; his dungeon in the Dominican monastery; his statue, which serves as a support to the cathedral; and, in the nave of the church, a brazen plate on the spot where the venerable martyr listened to his sentence of death; also the place, in a garden, where he was burned. After the council had been convinced of the heresy of Huss, the Bishop of Concordia read, in the cathedral, the sentence that his books should first be burned, and that he, as a public and scandalous heretic, and an evil and obstinate man, should be disgracefully deprived of his priestly dignity, degraded, and excommunicated. The sentence was immediately executed, and began with the degradation. The Bishop of Milan and six other bishops led Huss to a table where lay the garments used in the mass, and the other raiment of the priests: they clothed him with them, and when he was in full dress, with the cup in his hand, the bishops once more called upon him to save his life and honour, and to abjure his opinions. Huss refused, and spoke to the people from the scaffold. After he had spoken, the bishops cried out to him, 'Descend from the scaffold.' The Bishop of Milan and another bishop now took the cup, saying, 'O Huss, we take from thee the cup in which was offered the blood of Christ; thou art not worthy of him.' The other bishops then came forward, and each one took off some part of the priestly apparel with the same speech. When they had finished with the clothes they scraped his shaven crown (to designate the removal of the oil of consecration). Finally, when the excommunication was ended, they placed upon his head a paper crown, nearly a yard high, with devils painted upon it, and the inscription, 'John Huss, arch-heretic.' The bishops now turned to the emperor and said, 'The holy council of Constance now surrenders to the temporal power and tribunal John Huss, who has no longer office or dignity in the church of God.'[1] The emperor arose and took Huss, and said to the palatine Louis, 'As we, dear cousin and prince, wear the temporal sword, take this John Huss and have him punished as becomes a heretic.' Louis laid down his princely ornaments, and led Huss to the Provost of Constance, to whom he said, 'Upon the sentence of our gracious lord, the Roman Emperor, and our special order, take this Master Huss, and burn him as a heretic.' The governor gave him to the executioner and his attendants, and Huss was burned.

CONSTANCE, LAKE OF (anciently *Lacus Brigantinus;* German, *Boden See*), a lake, Central Europe, forming a common centre, in which Switzerland and the territories of Baden, Würtemberg, Bavaria, and Austria meet. It lies between lat. 47° 28′ and 47° 50′ N.; and lon. 9° and 9° 42′ E.; length, N.W. to S.E., 40 miles; greatest breadth, about 9 miles; area, 200 square miles; greatest depth, which is between Friedrichshafen and Rorschach, 964 feet; 1283 feet above sea level. At its N.W. extremity the lake divides into two branches or arms, each about 14 miles in length; the north arm is called the Überlingen Lake, after the town of Überlingen, on its north bank; the south branch the Zellersee or Untersee, in which is situate the fertile island of Reichenau, belonging to Baden, about 3 miles long and 1½ broad. The Rhine enters the lake at Rheinek, at its S.E. extremity, and leaves it at Stein, at its N.W. termination. Various other smaller rivers empty themselves into it. The lake, the waters of which are of a dark-green hue and very clear, are subject to sudden risings, the

[1] The Catholic clergy have always maintained that they cannot be concerned in the shedding of blood, being prohibited from so doing by the ecclesiastical law, so that a priest cannot even be a surgeon. On this ground the Inquisition professes never to have taken away life; all that it has done is to deliver up culprits to be dealt with by the secular power.

causes of which are unknown. In 1770 it rose in one hour from 20 to 24 feet above the ordinary level. It freezes in severe winters only. It is frequented by numerous aquatic birds, and contains a great variety and abundance of fish, including salmon, salmon-trout, pike, and carp. The traffic on it is considerable, although its navigation by sailing vessels is rendered dangerous by sudden and violent squalls. Steamers ply on the lake between Constance and various points on its shores. The banks are either flat or gently undulating, and are not remarkable for picturesque beauty; but they are extremely fertile, and are covered with corn-fields, orchards, and gardens, interspersed with ruined castles, and other remains of the middle ages, and with numerous towns and villages, producing altogether a very pleasing and striking effect.

CONSTANCE FALCON, or PHAULKON, a political adventurer of the seventeenth century, whose proper name was *Constantine*. He was born in the island of Cephalonia. His mother was a Greek. At the age of twelve he embarked for England, whence he went to the East Indies. Having gained some property in the service of the Company, he undertook a trading voyage to the coast of Malabar. He was shipwrecked, and lost everything; but meeting with an ambassador from the King of Siam to Persia, who had suffered the same misfortune, he procured a bark, and conveyed the Siamese envoy to his own country. The latter recommended Constance to the *barcalon*, or prime minister, who took him into his service. On the death of his master the king offered him the same post, which he accordingly accepted. He undertook the project of introducing Christianity among the Siamese, and induced the King of Siam to send an embassy to Louis XIV. The ambassadors died on the route; but the French monarch hearing of the scheme sent two envoys, with some Jesuits, to Siam. French troops were also introduced into the country. These circumstances aroused the jealousy of the native princes and nobility, the result of which was a conspiracy which terminated in the dethronement of the king and the death of Constance, who was beheaded.

CONSTANT DE REBECQUE, HENRI BENJAMIN, born at Lausanne, 1767; one of the most distinguished authors and greatest orators of the liberals or constitutionalists on the left side of the French chamber of deputies. He was educated in the Carolinum, at Brunswick, in Germany, and at a later period studied the law. At the beginning of the revolution he went to Paris, conducted before the council of the Five Hundred the cause of his countrymen who had been expelled by the repeal of the edict of Nantes, and soon distinguished himself by several works upon politics and revolutionary subjects, while he studied the German language and literature. With equal courage and sternness of purpose he opposed anarchy and despotism. As a member of the *cercle constitutionnel*, in 1797, he distinguished himself by the fire of his orations. This caused his election to the office of tribune; but his speeches and writings rendered him odious to the first consul, and he was consequently dismissed from his station in 1802. Similarity of sentiments connected him with Madame de Stael; and with her he travelled through several countries, till Napoleon permitted him to return to Paris for a limited period. He then went to Göttingen, and employed himself principally in the study of German literature, and in preparing a work on the history of different modes of worship. He again appeared at Paris in 1814, in the retinue of the Crown-prince of Sweden, and publicly showed himself zealous for the cause of the Bourbons, particularly in March, 1815, by the violent articles which he published in the Journal des Débats. Notwithstanding this, however, he suffered himself to be elected counsellor of state by Napoleon, and assisted in forming the constitution of the Champ de Mai, which he defended warmly in many writings. On the return of the king he went to Brussels. In Nov. 1816 he was permitted to return to Paris. In 1819 he was elected a member of the Chamber of Deputies. As an orator he was one of the most clear and eloquent defenders of the *Charte*, and of constitutional principles; but his voice was indistinct and his speech hasty, nor had he that powerful expression which carries away the hearer. In general he wrote better than he spoke; but no one knew better how to take advantage of any opportunities afforded by his opponents. His works are distinguished by perspicuity and liveliness of style, richness of imagination, and often by depth of knowledge and acute observation, although mingled occasionally with declamation, witticisms, and sophisms. As early as 1796 he excited attention by his work De la Force du Gouvernement actuel de la France, &c.; again, in 1797, by Des Réactions Politiques, and Des Effets de la Terreur. In 1800 he wrote Suites de la Contre-Révolution de 1660 en Angleterre. The following essays are much esteemed:—De l'Esprit de Conquête et de l'Usurpation dans leurs Rapports avec la Civilisation Européenne (1814); De la Liberté des Brochures, des Pamphlets et des Journaux, sous le Rapport de l'Intérêt du Gouvernement (1814); Réflexions sur les Constitutions, la Distribution des Pouvoirs, et les Garanties dans une Monarchie Constitutionnelle (1814); Observations sur le Discours prononcé par S. E. le Ministre de l'Intérieur en Faveur du Projet de Loi sur la Liberté de la Presse (1814); De la Responsibilité des Ministres (1815); Principes de Politique applicables a tous les Gouvernemens Représentatifs et particulièrement à la Constitution actuelle de la France (1815); Principes du Droit public (1815); and De la Religion considérée dans sa Source, ses Formes et ses Développemens (Paris, 1824, two vols.) Besides these works he translated Schiller's Wallenstein into French, and adapted it for the stage. At the election of the chamber in 1824 he was again chosen deputy, and after a long dispute at last acknowledged as a French citizen. He died at Paris, December 8, 1830.

CONSTANTIA, two farms in the colony of the Cape of Good Hope, between Table Bay and False Bay, 3 leagues from the Cape. They are celebrated for their wine, made from vines brought originally from Persia and the Rhine. A small quantity of this wine is annually made.

CONSTANTINE, a town in the French territory of Algeria, North Africa, capital of a province of same name, on a rocky peninsula, 1968 feet above the sea, and accessible only on one side. It is surrounded by walls, built by the Arabs chiefly with stones which the Romans had hewn, and is entered by four handsome gates. The streets, though well paved, are narrow and dirty, and the houses are very indifferent. The only edifice deserving of particular notice is the palace of the bey, now the residence of the French governor. It is more remarkable for its internal decorations than for its external structure. Both within the town and in the vicinity Roman remains abound. The manufactures consist chiefly of woollen and linen goods and various articles in leather; the trade is in corn, linen, and wax. Constantine was built by the emperor whose name it bears, on the site of Cirta, which had long been the capital of the Numidian kings, but which in process of time had fallen into decay. In 1837, after a long siege, the French took it by assault. Pop. about 34,000.

CONSTANTINE, Caius Flavius Valerius Aurelius Claudius, surnamed the *Great*, son of the Emperor Constantius Chlorus and of his wife Helena, was born A.D. 274. When Constantine's father was associated in the government by Diocletian, the son was retained at court as a hostage, but was educated with the greatest care. After Diocletian and Maximian Hercules had laid down the reins of government, Constantine fled to Britain, to his father, to escape the machinations of Galerius. After the death of his father he was chosen emperor by the soldiery, in the year 306. Galerius was very unwilling to allow him the title of *Augustus*, and gave him that of *Cæsar* only. Constantine, however, took possession of the countries which had been subject to his father, namely, Gaul, Spain, and Britain. He overcame the Franks, who had formerly overrun the territory of Gaul, made prisoners of two of their leaders, followed them over the Rhine, surprised and defeated them. He then directed his arms against Maxentius, who had joined Maximian against him. In the campaign in Italy he saw, it is said, a flaming cross in the heavens, beneath the sun, bearing the inscription, '*In hoc signo vinces*' (Under this sign thou shalt conquer). In the following night Christ himself appeared to him, and commanded him to take for his standard an imitation of the fiery cross which he had seen. He accordingly caused a standard to be made in this form, which was called the *labarum*. Some days after this (October 27, 312) he vanquished the army of Maxentius, under the walls of Rome, and drove it into the Tiber. He then entered the city in triumph, set at liberty all whom Maxentius had unjustly imprisoned, and pardoned all who had taken up arms against him. He was declared by the senate, chief, Augustus, and *pontifex maximus*. In the year 313, together with Licinius, he published the memorable edict of toleration in favour of the Christians. By this every one was allowed to embrace the religion most agreeable to his own mode of thinking, and all the property was restored to the Christians that had been taken from them during the persecutions. They were also made eligible to public offices. This edict marks the period of the triumph of the cross and the downfall of paganism.

Constantine had married his daughter to Licinius; but the latter, jealous of his fame, conceived a mortal hatred against him, which he displayed by persecuting the Christians. Both emperors took up arms and met in Pannonia, A.D. 314. Constantine, surrounded by bishops and priests, besought the assistance of the God of the Christians; while Licinius, calling upon his soothsayers and magicians, relied upon the protection of their gods. Licinius was defeated, but the conqueror granted him peace. He, however, renewed hostilities, was vanquished again, taken prisoner, and put to death at Constantine's command. Thus the latter became, in 325, the sole head of the Eastern and Western Empires. His first and chief cares were the establishment of peace and order, and the propagation of his religion. Many beneficial decrees were proclaimed by him. Among these were those which abolished all the establishments of debauchery, ordered the children of the poor to be supported at his expense, gave permission to complain of his officers, and promised that the emperor would not only hear complaints, but compensate the complainants for injuries received, when they were proved to exist. He diminished the land-taxes one quarter; and to secure a fair distribution of them, he caused a new valuation of estates to be taken. The state treasury had always been enriched by the property of criminals; but Constantine spared the property of their wives, and ameliorated the condition of their children. Death in prison, he said was a cruel punishment for the innocent, and an insufficient penalty for the guilty; he therefore ordered all trials of prisoners to take place at once. He forbade the use of unwholesome dungeons and oppressive chains. The reason which he assigned was, that it was his duty to secure the person of the accused, but not to injure him. He gave leave to sick persons, widows, and orphans, to appeal from the local magistrates, and refused this privilege to their adversaries. It had been customary for the heirs of a person deceased to divide his slaves among them; Constantine forbade the separation in these cases of husbands from their wives, and of parents from their children. Divorces had been very common among the Romans, but he made them much more difficult. To the Christians he gave permission not only to erect churches, but to be remunerated for the cost of them from his domains. Amidst all the cares of government and the occupations of war he found leisure to assemble the Council of Arles, to put an end to the schism of the Donatists. The œcumenical council held at Nice, in Bithynia, A.D. 325, was attended by him in person.

November 26, 329, he laid the foundations of a new capital of the empire, at Byzantium, upon the Bosporus, in Thrace. The city of Byzantium had been almost entirely destroyed by Severus; it was rebuilt by Constantine, enlarged and adorned with open squares, fountains, a circus, and palaces, and called by his own name. Highly favoured by nature, it soon rivalled Rome herself. All the wealth of the empire was collected in the East; thither the nations poured their tribute and their trade; and Rome, the ancient mistress of the world, sunk from her supremacy. Constantine divided the empire into four parts, which were governed by four prætorian prefects. These four parts contained thirteen dioceses, each under the direction of a vicar, and the dioceses comprised 117 provinces. Constantine contributed to bring much evil on the empire by employing mercenary troops to guard the frontiers; and the legions which had occupied the frontiers were dispersed in the provinces. Towards the close of his life he favoured the Arians, to which he was induced by Eusebius of Nicomedia; and he even banished many Catholic bishops. In the year 337 he fell sick in the neighbourhood of Nicomedia, was baptized, and died after a reign of thirty-one years.

Constantine committed a great political error in dividing his empire among his three sons, Constantine, Constantius, and Constans. The condemnation of his son Crispus, who had been falsely accused by his stepmother of an attempt to seduce her, has always been considered a stain on his memory. His zeal for Christianity appears to have been excited not less by the knowledge that the religion which was embraced by a majority of the inhabitants of the Roman Empire must prevail, and that, of course, the strength of the government must be increased by protecting it, than by a wish to apply its consoling powers to the relief of a heavy conscience. He has been accused of inordinate ambition, excessive liberality, and an oriental fondness for parade. But he was brave at the head of his army, mild and indulgent in his intercourse with his subjects, the favourite of his people, the terror of his foes. In the year 332 he fought successfully against the Goths, who had already experienced his power. His eldest son gained many victories over them, and about 100,000 of the enemy perished by the sword or by hunger. Constantine made use of his advantages only to grant them a favourable peace, upon terms equally beneficial to himself. He took this opportunity to rid his empire of a disgraceful tribute which his predecessors

had paid to these barbarians, and to secure his frontier upon the Danube. The Sarmatians, who had been expelled their country by the slaves whom they had injudiciously armed against the Goths, and who took refuge in his dominions, he provided with lands in Thrace, Lesser Scythia, Macedonia, and in Italy itself. He even resolved, in his fifty-sixth year, and but a short time before his death, to take the field against the Persians. He was fond of the sciences as well as of arms, and gave them his protection. He read much, and wrote nearly all his own letters. In Eusebius we find many proofs of his theological learning. Some of the martyrologists have counted him among the saints, and fix the 20th of May as his festival. The Greeks and Russians observe it upon the 21st of the same month. Among all the writers who have attempted to describe the character, influence, and policy of Constantine, Gibbon, from the extent of his researches and the profoundness of his views, appears to deserve the first place, though his impartiality is more than doubtful.

CONSTANTINE, Grand-prince of Russia. Constantine Cæsarovitch Paulovitch, grand-prince of Russia, and second son of Paul I., was born May 9, 1779. The characteristics of this prince were activity, energy, and rudeness, often merging into barbarity, and a degree of personal courage approaching to rashness. In 1799 he distinguished himself, under Suwarroff, both as a soldier and a commander. Paul I. bestowed upon him the title of Cæsarovitch as a reward for his services. At Austerlitz, in 1805, he distinguished himself by his bravery at the head of the guards, after he had been betrayed by his courage into a too hasty advance. In 1812, 1813, and 1814 he attended his brother, the Emperor Alexander, in all his campaigns. He appeared at the Congress of Vienna, and received from the Emperor Francis the command of a regiment of cuirassiers. He was afterwards employed in superintending the affairs of the new Kingdom of Poland. He was then successively made military governor and generalissimo of the Polish troops, and was present, as a deputy, at the last diet. He resided at Warsaw in great splendour. By an imperial ukase of April 2, 1820, he was divorced from his wife, a princess of Coburg, who resided in Switzerland; and was married, May 24, 1820, by permission of the emperor, to a Polish countess, Johanna Grudzinska, who was afterwards honoured with the title of *Princess of Lowicz*, from the name of some estates in Masovia, which were bestowed upon the grand-pr.nce. The title was to descend to the children of the marriage. Before this marriage took place it was decreed, by an imperial ukase, that the children of princes who were not related, by the mother's side, to any reigning house, should have no claims to the throne of Russia, in any case whatever. The prince had, during the lifetime of his brother Alexander, renounced, in a regular instrument, dated January 14, 1822, all pretensions to the throne; notwithstanding which he was proclaimed emperor at Petersburg, in his absence, upon the decease of his brother, in December, 1825; but as he preferred to adhere to his renunciation, his younger brother, Nicholas, became successor to Alexander. The grand-prince was present at the coronation of his brother at Moscow, September 3, 1826. In 1829 the grand-prince retired from Warsaw, where he resided during the time of his administration, which had little to distinguish it but the rude and savage character of the ruler. He died in 1831, at the age of fifty-two, execrated by the Poles as one of their most barbarous oppressors. Many of the actions recorded of him prove him to have been a detestable tyrant, who had repeatedly been guilty of the grossest outrages on humanity.

CONSTANTINOPLE, called by the Turks *Stamboul*, by the Greeks *Istampoli* (both derived from the Greek *eis tēn polin*, into the city), a celebrated city, Turkey in Europe, capital of the Turkish Empire, lat. 41° 0′ 18″ N.; lon. 28° 59′ 15″ E., picturesquely situated on an undulating declivity or series of gentle hills, at the east extremity of a triangular promontory of the province of Rumili, having the Sea of Marmara and the Bosporus on the south and east, and the Golden Horn, an inlet of the latter of about 6 miles in length, on the north. It is thus surrounded by water on all sides excepting the west, and has a sea front altogether of about 8 miles in extent. Taking the form of the ground on which it stands, the city is also triangular in shape, its apex projecting into the Bosporus, and its base, a lofty double wall of 4 miles in length, stretching across the promontory, from the Sea of Marmara to the Golden Horn. Each of the sides may be about 3¾ miles in length, and within these limits the whole of the city proper is included. On the opposite side of the Golden Horn, and also occupying the extremity of a promontory, sometimes called the Peninsula of Pera, are situated the extensive suburbs, Galata, Pera, and Tophana, to be afterwards alluded to. Constantinople was formerly walled on all sides; but those along the Golden Horn and Sea of Marmara, the north and south sides of the city respectively, are in a ruinous state, and in many places have altogether disappeared. The inland or west wall, a magnificent specimen of mural architecture, containing six gates, though also dilapidated in parts, could be easily restored. The streets are extremely narrow, dark, dirty, and ill-paved, and so crooked and tortuous that hardly any two of them run for any length parallel to each other, the whole seeming one vast and incomprehensible labyrinth of filthy lanes. The houses are generally low and ill-built, consisting of wood, earth, and in some cases of rough, unhewn stone, the latter forming the foundation, and rising to the height of 8 or 10 feet, on which is reared a superstructure of wood, supported on curved beams which rest upon the masonry. A far projecting roof, surmounted by a cupola, which commands a view of the distant country, covers the whole. The windows are strictly closed with lattice-work of cane, in the centre of which the wife of the Turk, excluded from public view, endeavours to see what is passing in the street. The city is supplied with water by public fountains, which are very numerous, and some of them extremely beautiful, having pure white marble façades, elaborate arabesque ornaments, and Chinese roofs; they generally stand in the centre of an open 'place,' or square. On the extreme N.E. point of the promontory on which the city stands, called Point Serai, is situated the Seraglio or palace of the Sultan, having the Bosporus in front and the Golden Horn on the left, and commanding a magnificent view of the opposite shore, including the beautiful town of Scutari, and its cypress-covered hills. The Seraglio, with its gardens and groves, includes a large space, and is washed by the sea for two-thirds of its extent. Having been enlarged and altered at various periods, according to the taste or caprice of the princes and sultanas, it now consists of a conglomeration of buildings, clustering together without order or design. Its apartments, however, are spacious and richly furnished. At the principal entrance is a large and lofty gate, called Babi Humayon, 'the high door' or 'sublime porte,' from which has been derived the well-known diplomatic phrase, all political business being transacted, as supposed, under this portal. Within the precincts of the palace is the celebrated *Divan* and the *Harem*, with the 'Garden of Delight,' in which are numerous gorgeous parterres and pavil-

ions; the latter as bright with painting and gilding as the flowers which blossom on every side, while clusters of roses bloom in baskets of gilded wicker-work, and fountains murmur under the deep shadow of overhanging boughs. Near the Seraglio there is a battery of heavy cannon, the fire of which is happily confined to rejoicing days.

There are altogether about 300 mosques in Constantinople, all of them more or less distinguished by grandeur and beauty; but the most remarkable are the royal mosques, of which there are about fifteen, esteemed the finest in the world; of these, the largest and most splendid is that of Suleimania, situated on the N.E. side of the city, and standing in the midst of a large square, surrounded inside by an arcade upon pillars of granite and marble. Next to it in extent, but of much older date, is the mosque of St. Sophia, near the east extremity of the city, the pattern of almost every mosque in the land; its walls and domes, of which last it has twenty of equal dimensions, springing from the same level, and sustained by twelve huge columns, are encrusted with mosaic, forming various figures and devices. The court or open square in which it stands is paved with marble, and shaded by fine plane-trees. This is the most ancient existing Christian church, having been only converted into a mosque in 1453. It has been recently thoroughly restored by an English architect, by order of the sultan, and the layer of plaster removed by which the superb mosaics and frescoes that decorate its walls was covered. The mosque of Yeni Djami, known also as that of Sultana Valide, was built by the mother of Mohammed IV., and is esteemed one of the most magnificent in the capital. It stands almost on the edge of the port, and this point being the ferry between Galata and Stamboul, is constantly thronged with boats. Here almost every Frank first lands in the 'City of the Faithful.' The mosque is constructed of white marble, and has two peculiarly elegant minarets, encircled by no less than three galleries of richly perforated workmanship. The principal dome rests upon four lesser ones, which appear to lift it to the clouds. Another celebrated mosque is that of Sultan Achmet, a little south-east from the former. From the elevated position this building occupies, it is the most conspicuous object in the city when viewed from the Sea of Marmora. The minarets are of great beauty, and ascend to an immense height. All the other mosques are much less in size than those described, but very much resemble them in plan and other features. All of them are enriched by splendid columns of marble, Egyptian granite, or serpentine, and have massive and highly ornamented gateways and porches, and handsome courts and cisterns for ablution.

The bazaars of Constantinople are numerous, but in no way very remarkable. Some of them are covered, others open. The covered bazaars have a somewhat mean appearance, resembling a row of booths at a fair, but the arrangement and manner of exposing the gay and glittering wares is sufficiently attractive. The principal or *Great Bazaar* consists of long avenues covered over with lofty arches of brick, lighted by apertures in the roof, and branching off in different directions. The ceilings of the vaults, and various parts of the walls, are ornamented with painted flowers and devices. On each side of the passage are counters and stalls, with a wide passage between them, and on each counter sits the merchant, generally smoking his pipe or chibouck, with his crossed legs drawn under him. The bazaars, both the open and covered, are severally allotted to particular trades and merchandise; they are generally so crowded, chiefly by ladies, that it is difficult to pass through them. Constantinople has but one remarkable square, called the At-Meidan. It occupies the site of the ancient *Hippodrome* ('horse-course'), a place at one time of great splendour, having been ornamented with marble colonnades, and surrounded by seats like an amphitheatre. The present area is an irregular quadrangle about 260 yards long by 150 wide, containing some obelisks which belonged to the ancient structure, one of which, of granite, is composed of a single piece 50 feet high. There are about 130 public baths in the city, mostly of marble, of plain exterior, but handsome and commodious within, with every accommodation and appliance requisite. They are divided into a number of circular rooms, lighted from above, and sufficiently spacious to admit a number of bathers at the same time. There are a vast number of coffee-houses and lodging-houses, called *khans*, dispersed throughout the city. The latter, amounting to nearly 200 in number, resemble immense stone barracks or closed squares. They are intended for the use of strangers during their temporary sojourn in the city, who may have an apartment here, with command of the key, in which they may deposit their property, and live themselves in perfect security, without any further charge than a small present to the servant at departing. The numerous cemeteries scattered throughout Constantinople, but mostly in its vicinity, outside the western wall, are among its greatest ornaments. From their antiquity they have become vast forests, extending for miles round the city and its suburbs. The people of every creed have distinct quarters allotted to them.

The few manufactures of Constantinople are chiefly confined to articles in morocco leather, saddlery, tobacco-pipes, fez caps, arms, perfumes, gold and silver embroideries, &c.; but its foreign commerce is considerable. The harbour, or Golden Horn, which more resembles a large river than a harbour, is deep, commodious, well-sheltered, and capable of containing 1200 large ships, which may load and unload alongside the quays. It is about 6 miles long, and a little more than half a mile broad at the widest part; its general breadth, however, does not much exceed a quarter of a mile; at its entrance it has a width, from Seraglio Point or Point Serai to the opposite shore, of about 1000 yards. The horn is usually crowded with vessels and light boats, and presents a lively bustling scene. Among the annual imports are corn, iron, timber, tallow, and furs from the Black Sea and Russia; cotton stuffs and yarn, woollens, silks, watches, furniture, jewelry, coffee, sugar, pepper and spices, rum, &c. The exports consist of silk, carpets, hides, wool, goats'-hair, madder, valonia, &c. The number of vessels entered in 1870 was 23,478, of 4,996,895 tons burden.

Of the suburbs of Constantinople, the largest is GALATA, the principal seat of commerce, and the usual landing-place from the Sea of Marmara. It is here that the merchants of all nations have their stores and counting-houses. Here too are situated the arsenals, the dock-yard, the artillery barracks, the government docks, warehouses, rope-walks, and workshops, extending along the shore of the Bosporus for nearly 1½ mile. It is an ancient city, and was strongly fortified.—PERA occupies the more elevated portion of the promontory, of which Galata forms the maritime port. It is separated from the latter by a wall with gates, which are closed at night.—TOPHANA is situate a little further up the Bosporus than Galata, of which it forms a continuation. Here is a government foundry and arsenal for cannon, the two words *top-hana* signifying a cannon repository; and a spacious quay, the usual place of embarkation for Scutari and the villages on the Bosporus.

Constantinople occupies the site of the ancient Byzantium, and was named after Constantine the Great, who rebuilt it in A.D. 328. No city in the world has been subjected to such numerous and celebrated sieges, and no other has undergone so many vicissitudes of fortune. Yet it has only been taken twice, namely, in 1204 by the Crusaders, who retained it till 1261; and by the Turks under Mohammed II., May 29, 1453—an event which completed the extinction of the Roman Empire in the East. The pop. of Constantinople is uncertain, but would appear to be somewhere between 400,000 and 500,000, composed of Turks, Arabians, Greeks, Armenians, Jews, and Europeans. See BYZANTINE EMPIRE and BYZANTIUM.

CONSTANTINOPLE, GENERAL COUNCILS OF. These include the second, fifth, sixth, the Trullan, and the eighth. The second was convoked by Theodosius the Great, in May, 381, to put down the enemies of the Nicene Creed, who had already been restrained by his decrees. One hundred and fifty oriental bishops, assembled for that purpose, condemned the Arians of all parties, together with other heretics, and, in a supplement to the creed above mentioned, they decided that the same honour was due to the Holy Ghost as to the Father and the Son, with a view of recalling to the orthodox faith the Macedonians or Pneumatomachists, who had adopted the Arian doctrine of the inferiority of the Holy Spirit. These, however, separated from the council, and suffered themselves to be declared heretics. The ordinances of this council made the Bishop of Constantinople next in rank to the Bishop of Rome, and committed the disputes of their bishops to the decision of the emperor. Theodosius confirmed the decrees of the council, and even procured them authority in the West. The Greek Church took advantage of the circumstance that the Holy Ghost was declared to proceed only from the Father to set up their claims to orthodoxy against the Catholics. This council was closed on the 30th of July, 381. The fifth general council was held by the Emperor Justinian, from May 4 to June 2, 553, to decide the dispute of the Three Chapters. The Three Chapters were three doctrines of the Bishops Theodore of Mopsuestia, Theodoret, and Ibas of Edessa, who were suspected of Nestorianism, and declared heretics by the council. The 165 bishops, nearly all from the East, who were assembled at this meeting, excluded from their communion the Roman Bishop Vigilius, who would not unconditionally condemn the Three Chapters, and with him many divines, even some that were dead; for example, Origen. They were only the contemptible organs of the senseless zeal of Justinian. The sixth council, held from Nov. 7, 680, to Sept. 16, 681, by the order of the Emperor Constantine, and presided over by the legates of the Roman Bishop Agatho, condemned the doctrines of the Monothelites, and declared their leaders heretics. Appealing not so much to Scripture and reason as to the fathers, they decided, in opposition to the heresy of the Monothelites, that Christ acted with both a divine and a human will, in accordance with his two natures. Among the condemned Monothelites was Honorius, the predecessor of Agatho. As these two councils made no new ecclesiastical laws, the Emperor Justinian II., in 692, again summoned a general council, which, from the purpose of the meeting to supply the defects of the fifth and sixth, was called the *quinisextum*, and because it was held in the Trullan palace, the *Trullan Council;* but it is not acknowledged by the western church. It confirmed the decrees of the previous sessions, and instituted rigid laws for the clergy; among them were those fixing the rank of the patriarchs and the permission of marriage to priests, which were so offensive to the Latin Church that she rejected all the decrees of this council; but in the Greek Church they are still valid. The eighth general council was convoked by the Emperor Basilius I., and was held at Constantinople between Oct. 5, 869, and Feb. 28, 870. It declared against the Iconoclasts, deposed Photius, and confirmed St. Ignatius in the see of Constantinople. This council is not recognized by the Greek Church. See ICONOCLASTS.

CONSTELLATIONS are the groups into which astronomers have divided the fixed stars, and which have received names for the convenience of description and reference. The division of the stars into groups was begun in ancient times. It is plain that the union of several stars into a constellation, to which the name of some animal, person, or inanimate object is given, must be entirely arbitrary, since the several points (the stars) may be united in a hundred different ways, just as imagination directs; for instance, the best known of all the constellations, the Great Bear, might just as well be made to represent a great variety of other things. It is enough that astronomers know what is meant by a certain constellation, so as to understand each other. The division of the heavens into constellations is like the division of a classic into pages and paragraphs. Ludwig Ideler's Untersuchung über den Ursprung und die Bedeutung der Sternnamen, Berlin, 1809 (Inquiry into the Origin and Meaning of the Names of the Stars, by Louis Ideler), is a work of great interest.

The ancient divisions of the constellations have been retained by the moderns, with the addition of such as have been newly discovered. When and where the first constellations were formed is not known. It is very probable that some of the most remarkable collections of stars, such as Charles's Wain, the Pleiades, Orion, &c., were formed into constellations, and had names given them, in very early ages. Some of them, by their different appearances, serve to mark out the different seasons of the year, and on that account were not only considered as a kind of directory for the commencement of ploughing, sowing, and other operations of husbandry, but were also regarded as having a great influence on the temperature of the air and the fertility of the earth. Hence, from their being signs, pointing out the times of the year when heat or cold, dryness or moisture predominated, they were regarded as the causes of these states of the atmosphere. They were also imagined to have dominion over minerals, vegetables, and animals; over the complexions, constitutions, and even the dispositions of mankind. This opinion obtained credit the more easily, as the sun, moon, planets, and stars were believed to be of a divine nature, insomuch that some persons conceived that they were inhabited by an inferior kind of deities, who governed their motions and directed their influences; while others thought that they were animals, each of which had a living soul; and others again supposed that they were animated by a part of the substance of the Supreme Being. Each of these notions led mankind to pay them a sort of religious worship.

The Egyptians divided the heavens into several regions, which they called the stations or mansions of their gods. They worshipped the heavenly bodies, and more especially the sun and moon, which they called their *great gods*, denominating the sun *Osiris*, and the moon *Isis*. They also imagined that they found in various animals some qualities corresponding to the motions, appearances, or influences of the sun, moon, and some of the stars; hence they were induced not only to use those animals in their hiero-

glyphic representations of their deities, but also to pay them divine honours, and denominate the constellations from them. The Greeks, who learned astronomy of the Egyptians, retained several of their figures, as the ram, the bull, the dog, &c., but accommodated almost all of them to the fabulous history of their gods and heroes, whom they placed among the stars. The Romans imitated them, and the poets of both nations have given us wild and romantic fables about the origin of the constellations, probably derived from the hieroglyphics of the Egyptians, and transmitted, with some alterations, from them to the Greeks. Many of the figures that occur among our present constellations were originally Egyptian. The names which the Chinese and Japanese give to the groups of stars forming our constellations are very different from those which we have given them. Some Arabians, too, though they received their astronomy from the Greeks, changed the names of the constellations, from a superstitious notion that it was unlawful to draw any human figure. The zeal of some Christian philosophers has induced them to endeavour to drive the heathen deities and heroes from the skies. The Venerable Bede gave the names of the twelve apostles to the twelve signs of the zodiac. Judas Schillerius in 1627 completed the reformation, and gave Scripture names to all the constellations in the heavens. Weigelius, professor of mathematics in the University of Jena, made a new order of constellations, converting the firmament into *cœlum heraldicum*, and introducing the arms of all the princes of Europe among the constellations. The more intelligent astronomers, however, never approved of innovation, because it tended to introduce confusion into the science. The old constellations, therefore, are for the most part still retained.

Ptolemy enumerates, in his Almagest, forty-eight constellations, which are still called the *Ptolemæan*. They are the following:—1. The twelve signs of the zodiac (see ECLIPTIC). 2. Twenty-one constellations found in the northern hemisphere—the Great Bear (*Ursa Major*), the Little Bear (*Ursa Minor*), Perseus, the Dragon, Cepheus, Cassiopeia, Andromeda, Pegasus, Equulus (Horse's Head), the Triangle, the Waggoner (*Auriga*), Boötes, the Northern Crown (*Corona Borealis*), Ophiuchus, the Serpent (*Serpentarius*), Hercules, the Arrow (*Sagitta*), the Lyre, the Swan (*Cygnus*), the Dolphin, the Eagle (*Aquila*). 3. Fifteen constellations in the southern hemisphere—Orion, the Whale (*Cetus*), Eridanus, the Hare (*Lepus*), the Great Dog (*Canis Major*), the Little Dog (*Canis Minor*), Hydra, the Cup (*Crater*), the Crow (*Corvus*), the Centaur, the Wolf (*Lupus*), the Altar (*Ara*), the Southern Fish (*Piscis Australis*), the Argo, the Southern Crown (*Corona Australis*).

The poets of antiquity very ingeniously connected the most popular fables of mythology with the different constellations. Some of the constellations, however, have been changed; and the ancients sometimes even added new ones, such as the Hair of Berenice (*Coma Berenices*), and the Antinous. Much still remained for modern astronomers to do. Hevelius introduced the twelve following new constellations:—the Shield of Sobiesky, the Squirrel, Camelopardalis, the Sextant, the Grayhounds, the Little Lion, the Lynx, the Fox and the Goose, the Lizard, the Little Triangle, Cerberus, and Mons Mænalus. When the Europeans began to navigate the southern hemisphere, many new stars of course appeared to them which they never had seen in Europe. Thus twelve new constellations were added in the sixteenth century—the Indians, Crane, Phœnix, Fly, Southern Triangle, Bird of Paradise, Peacock, American Goose, Hydrus or Water-snake, Sword-fish, Flying-fish, Chamæleon. Halley, in 1675, during his stay at St. Helena, added the Royal Oak (*Robur Carolinum*); and Lacaille, in 1750, during his stay at the Cape of Good Hope, added the fourteen following:—Apparatus Sculptoris, Fornax Chemica, Horologium, Reticulus Rhomboidalis, Equuleus Pictorius, Cæla Praxitelis, Pyxis Nautica, Octans Hadleianus, Antlia Pneumatica, Circinus (the Compasses), Quadra Euclidis, Telescope, Microscope, and Table Mountain. To these have been added the Lapland Reindeer, the Hermit, the Brandenburg Sceptre, the Telescope of Herschel, the Shield of Poniatowsky or Taurus Poniatowsky, the Honour of Frederic, and others which cannot well be enumerated here, as their names have not been sanctioned by all nations. Thus the professors of Leipzig made of a part of Orion the constellation of Napoleon, but it did not come into use. The different stars of a constellation are marked by Greek letters. Several have also particular names. They are also divided according to their apparent magnitude; thus we speak of stars of the first, second, and third, up to the sixth magnitude. The last are the smallest visible to the naked eye. One of the best works on constellations, in the present state of this science, is Bode's Anleitung zur Kenntniss des gestirnten Himmels, ninth edition, Berlin, 1823, with plates (Guide to the Knowledge of the Starry Heavens). Another work of still greater excellence, of which an abstract by Airy is given in monthly notices of the Royal Astronomical Society for February, 1848, is that by Struve, entitled Études d'Astronomie Stellaire, &c. (1847).

CONSTIPATION, or an undue retention of the fæces, may proceed from a variety of causes, and in its slighter degrees interferes so little with the performance of the ordinary bodily functions, that it can scarcely be considered as morbid; but in proportion as it is protracted becomes dangerous, and not unfrequently has a fatal termination. Its immediate effects are disordered appetite, a dry coated or clammy tongue, thirst, or a disagreeable taste in the mouth, dulness, giddiness, or pain in the head, torpor both of body and mind, irritability of temper, and gloomy desponding thoughts. Its indirect or more remote effects are various cutaneous affections, dyspepsia, colic, hysteria, hæmorrhoids, &c. In some persons constipation appears to be constitutional, but in most it is produced by indigestible food, astringent and stimulating drinks, sedentary habits, excessive indulgence in sleep, &c. The obvious cure is, first, the immediate removal of the accumulated substance by means of the milder purgatives, and then by a strict attention to regimen, including not merely regulated diet, but physical and mental exercise, pure air, everything, in short, conducive to vigour both of body and mind.

CONSTITUENT ASSEMBLY, the first convention of the delegates of the French nation (June 17, 1789), consisting of 600 deputies of the third estate, 300 of the nobility, and 300 of the clergy. The famous oath taken in the tennis court, June 20, 1789, not to dissolve until they had completed a constitution for their country, was faithfully observed. The assembly did not resign its functions until Louis XVI. formally accepted the constitution it had drawn up (Sept. 1791). See FRANCE.

CONSTITUTION, in medicine, the general condition of the body, as evinced by the peculiarities in the performance of its functions: such are the peculiar predisposition to certain diseases, or liability of particular organs to disease, the varieties in digestion, in muscular power and motion, in sleep, in the appetite, &c. Some marked peculiarities of constitution are observed to be accompanied with certain external characters, such as a particular colour and

texture of the skin and of the hair, and also with a peculiarity of form and disposition of mind; all of which have been observed from the earliest times and divided into classes, and which received names, during the prevalence of the humoral pathology, that they still retain. See TEMPERAMENTS.

CONSTITUTION, in the Roman Church, a decree of the pope in matters of doctrine. In France, however, this name has been applied, by way of eminence, to the famous bull *Unigenitus* (which see).—*Apostolic constitutions* is the name given to a collection of ecclesiastical laws and regulations, said by some to have been promulgated by the apostles, and collected by Clement I. Their contents betray a later origin. No father of the church before the fourth century mentions them. Epiphanius is the first who speaks of them as a genuine work of the apostles, though he does not pretend to deny the doubts which many persons entertained respecting their genuineness. The Trullan Council (692) considered only part of them genuine, and rejected the collection on account of the interpolations which it had experienced. Most probably this collection was made in the third century, and compounded of regulations already existing, and others invented by the compiler, who was an adversary of the Gnostics. But it is still very dubious whether the collection which we have at present under the above name is the same mentioned by the fathers of the church. The Catholics themselves are suspicious of them.

CONSTITUTION, the fundamental law of a state, whether it be a written instrument of a certain date, as that of the United States of America, or an aggregate of laws and usages which have been formed in the course of ages, like the English constitution.

I. Constitutions, according to their origin or their fundamental principle, may be divided into three classes:—1. Those established by the sovereign power. 2. Those formed by contracts between nations and certain individuals whom they accept as sovereigns on condition of their complying with the terms of the contract. 3. Those formed by a compact between different sovereign powers.

1. The first class may be again divided into: *a*, constitutions established by a free sovereign people for their own regulation—the only ones which rest on a just and philosophical basis (although such as are embraced in the other descriptions may be the best which circumstances will allow in given cases); of this sort are the constitutions of the United States; nd *b*, such as have been, in some instances, granted r the plenary power of absolute monarchs to their ›jects, and which in theory are the voluntary gift 'e beneficence of the ruler. These are called by 'rench *constitutions octroyées*, from *octroyer*, to . Such an instrument was Louis XVIII.'s 'e, which commenced with the words, 'Nous volontairement et par libre exercice de notre ité royale accordé et accordons, fait concession 'roi à nos sujets,' &c.

'he second great class of constitutions mentioned includes such as have been formed by a con- 'tween the future ruler and the people. These 'ually binding on each party as long as the 'fils his duty. Such, in a great degree, is h constitution.

' constitutions are compacts between seve- 'n powers. Such was the constitution of Empire and that of the United Provinces and such is also the Swiss Confederation. 'on of the United States of America, al- 'ent states call themselves sovereign, 't of fact, from the people of the 'tively, as is apparent from the

very beginning of the instrument, which is in these words—'We, the people of the United States,' and not 'We, the states.' Moreover, it can escape no one's observation, that the Congress, established by this constitution, has rights and powers far exceeding those which other confederate, but entirely distinct governments, are wont to allow each other, and that the constitution, in short, unites all the states into one nation, the government being called by all parties the *national government*. Governments entirely and virtually distinct from each other never would, however closely confederated, allow a government, particularly a national government, to be established over themselves. It seems, therefore, that the constitution of the United States is more than a mere compact between independent powers, yet less than the simple constitution of an undivided nation: it ought rather to be considered as forming one whole with the different constitutions of the states which have given up to the general government most of the rights of sovereignty, as that of making war and peace, coining, &c.

II. In regard to political principles, constitutions are: 1. Democratic, when the fundamental law guarantees to every citizen equal rights, protection, and participation, direct or indirect, in the government, such as the constitutions of the United States and of some cantons of Switzerland. 2. Aristocratic, when the constitution establishes privileged classes, as the nobility and clergy, and intrusts the government entirely to them, or allows them a very disproportionate share in it. Such a constitution was that of Venice, and such at one time those of some Swiss cantons, for instance, Bern. 3. Of a mixed character. To this latter division belong some monarchical constitutions, which recognize the existence of a king whose power is modified by other branches of government of a more or less popular cast. The British constitution belongs to this division.

III. The forms of government, established by the various constitutions, afford a ground of division important in some respects; and, lastly,

IV. The principle on which a constitution establishes the representation, or the way in which the people participate in the government, furnishes an important means of classification. 1. Some allow the people to partake in the government without representation. This was the case in many of the small states of ancient Greece, and also in the ancient Roman Republic, and is still the case in several of the small Swiss cantons, in which the whole people assemble and legislate. It is obvious that such a constitution can operate only where the number of citizens is very small, and even then it will be almost always objectionable. 2. Some are of a representative character; that is, all the citizens do not take an immediate part in the government, but act by their representatives. Constitutions of this sort, *a*, either establish a general and equal representation, as those of the United States; or *b*, connect the right of representation with particular estates and corporations. The term *representative constitution* is frequently applied exclusively to the former by way of eminence.

V. Representative constitutions may be divided into —1. Such as are founded on the union of the feudal estates, the clergy, nobility, citizens, and peasantry; the two latter of which derive their right of representation from the charters of the ancient corporations. 2. Such as establish the right of a general representation, like the American constitution, and such as partake of both characters, like the British constitution. Those of the first class either originated in the feudal times, or have been since copied from such as did. Our limits will not allow us to discuss the mode in which the estates grew up, and became the basis of these

constitutions. (See ESTATES.) We will only observe, that external causes exerted here their usual influence —that the feudal states were conglomerates of many heterogeneous bodies; and that it was reserved for later ages to unfold the true principles of government —to separate the essential from the unessential and injurious—to give stability, distinctness, and extent to principles before unsettled, indefinite, and limited in their operation.—For information respecting the various national constitutions, see the articles on the separate countries.

CONSTITUTIONISTS. See UNIGENITUS.

CONSUBSTANTIAL (Latin, *consubstantialis*), meaning *co-essential*, is our naturalized equivalent for the Greek term *homoousios*, the true signification of which disturbed the religious world early in the fourth century, as it was supposed to affect the orthodoxy of Christians regarding the Trinity, according as it might be understood rightly or the contrary. The Athanasians, or Trinitarians, at the Council of Nice in 325, gave the sense of the word as we now read it in the Nicene Creed, '*Of one substance* with the Father' (applied to our Saviour).

CONSUBSTANTIATION (otherwise *Impanation*), the mystical union of the body of our Lord Jesus with the sacramental elements, according to the tenets held by Martin Luther, as well as those of the early reformers who sided with him on that point, and which still forms a dogma in the system of his followers in the present day; who maintain that, after the consecration of the elements, the body and blood of Christ are substantially present with the substance of the bread and wine.

CONSUETUDINARY LAW, in contradistinction to statutory or written law, is that law which is derived by immemorial custom from remote antiquity. See COMMON LAW.

CONSUL, a name given—1, to the two highest magistrates in the republic of Rome, from whom it passed to certain high officers under the emperors; 2, to the three highest magistrates of the French republic during a certain period; and, 3, at the present day to certain officers of a diplomatico-commercial character.

I. In Rome, after King Tarquinius Superbus had been expelled by the joint efforts of the patricians and plebeians (509 B.C.), two consuls were placed at the head of the senate, the body in whose hands was the administration of the republic; *consul* signifying *adviser, counsellor*. These officers were to be annually elected. In Greek they were called *hypatoi* (the highest). Consuls were at first chosen only from among the patricians; at a later period (366 B.C.) also from the plebeians. In some cases both the consuls were plebeians, but this was an exception to the general rule. In order to be eligible to the consulship, the candidate was to be forty-five years of age (*ætas consularis*). But this law was frequently violated. Pompey was made consul in his thirty-sixth, Valerius Corvus in his twenty-third, Scipio Africanus, the elder, in his twenty-eighth, and the youngest Scipio in his thirty-eighth year. It was necessary, too, that the candidate should have passed through the inferior offices of quæstor, ædile, and prætor. Nobody was to be re-elected consul till after an interval of ten years; but this law was also in several instances disregarded. The candidate was required by law to be in Rome at the time of the election; but there are also many instances of the violation of this law. The election of the consuls took place in the comitia centuriata, in the Campus Martius, some months before entering office. One of the existing consuls presided. He who had most votes was called *consul prior*. His name was the first in the *fasti*. He also first received the *fasces*, and usually presided at the election of the magistrates for the next year. The time of election varied at different periods. The consuls elect were called *consules designati*. They entered on their office on the 1st of January, by sacrificing and praying in the capitol, after receiving the congratulations of the senate and people. Within five days afterwards they were obliged to repeat the oath which they had taken when elected, that they would not injure the republic, and that they would govern according to the laws. A similar oath that they had so done was required of them when they left their office. The exterior marks of honour of the consuls (*insignia*) were the same as those of the former kings, excepting the crown and the *trabea* (purple cloak); and instead of a sceptre they had a staff of ivory (*scipio eburneus*) with an eagle at its head. Their toga was lined with purple (*toga prætexta*); under the emperors it was embroidered. They sat upon an ornamented chair (*sella curulis*). Twelve lictors, with the fasces and axes, preceded them. In the beginning the lictors, with fasces, marched before each; but Valerius Publicola made a law that, in the city, they should precede only one. After that time the consuls enjoyed this honour by turns in alternate months. The one who was not preceded by the fasces had a public slave going before him (*accensus*), and the lictors following him. The consul who was first elected, or who had most children, or, if the number was equal, whose wife was living, or who had most votes, first received the *fasces cum securibus*. Whoever met the consul gave way to him, uncovered his head, descended from his horse, or rose, if he happened to be seated. If the consul saw any one neglect this form of respect he ordered the lictor to punish him (*animadvertere*). The annals of state were called *fasti consulares*, and particular years were designated by the names of the consuls then in office. Instead of saying, for instance, A.U.C. 690, it was said *M. Tullio Cicerone et L. Antonio consulibus;* hence *numerare multos consules*, instead of *multos annos*. In order to understand the authority of the consuls, it must be kept in mind that in the time of the Roman Republic the powers of the different branches of government were by no means kept so distinct as with us, and therefore much greater opportunity was then afforded for the assumption of undue authority. The division of powers is one of the most important inventions in the art of governing, and affords one of the greatest protections of liberty; much greater than is afforded by republicanism, or any form of government, without it. We find united in the consuls, to a great degree, the executive, judiciary, and legislative functions. In the beginning of the republic the authority of the consuls was almost as great as that of the preceding kings. They could declare war, conclude peace, make alliances, and even order a citizen to be put to death; hence Cicero ascribes to them *regiam potestatem* (Leg. iii. 3). But Valerius Publicola took the axe out of their *fasces*, that is, deprived them of their right over the lives of the citizens, and left them, at least while in the city, only the right to decree the punishment of scourging. Without the city, when they had the command over the army, they had the axe in the *fasces*, that is, the power to condemn to death. Publicola had a law enacted allowing appeals from the consuls to the people. The greatest check was put upon the consular power by the establishment of the tribunes of the people, each of whom had the right to oppose every measure of the consuls. Yet their power remained very great. They stood, in reality, at the head of the whole republic: all other officers were under them, the tribunes of the people only excepted: they convoked the senate, proposed what

they thought fit, and executed the laws. Laws proposed by them were generally called by their name. They received all despatches from the provinces and foreign kings, and gave audience to foreign ambassadors. In times of emergency the consular power was still further increased by the well known decree, 'Videant ne quid detrimenti respublica capiat' (they should see that the republic sustained no harm), by which they received unlimited power, and could even sentence to death without trial, levy troops, and make war without the resolve of the people first obtained. If a sudden riot took place, the consuls called the citizens to arms by the words, 'Qui rempublicam salvam esse velit, me sequatur'—equivalent to the reading of the riot act with us. At the beginning of their term of office the consuls divided the provinces among them by agreement or lot. A citizen who had been consul was called *consularis*, and had a higher rank than other senators. Pompey enacted a law that a consul should not be sent to a province until five years after he had laid down his office; and Cæsar decreed that he should remain there only for two years. Under the emperors the consular dignity sunk to a shadow, and at last Caligula wished to make his horse consul. Many consuls, at this period, were appointed in one year, until Constantine again appointed two annually, after the office had been abolished by Justinian. The pomp of the consuls under the emperors, was still greater than during the republic. Under the imperial rule there were three classes of consuls: the *consul ordinarius*, elected by the people, latterly by the senate; the *consul suffectus*, elected by the emperor; the *consul honorarius* was a titular officer with the rank, but without the power of a consul. This dignity was first conferred under Cæsar. The last consul at Rome was Theodorus Paulinus (A.D. 536).

II. In France the directorial government (third constitution) was abolished by the revolution of the 18th Brumaire, of the year VIII (Nov. 9, 1799), and a provisional consular government, consisting of Bonaparte, Sieyès, and Roger Ducos, established the fourth constitution, which was proclaimed Dec. 15, by which France was declared a republic under a government of consuls. Three elective consuls (Bonaparte, Cambacérès, Lebrun, the first receiving 500,000 and the others 150,000 francs annually) had almost uncontrolled executive authority, while the legislative power was in the hands of the tribunate and the legislative assembly: a conservative senate was also elected. But as early as Aug. 2, 1802, Bonaparte was proclaimed first consul for life, and thus the constitution of France became again monarchical. He had the power of naming his successor, proposing the two other consuls, appointing the senators, counsellors of state, and the presidents of the council of the people, while he could assemble, and determine the length of their sessions at his pleasure; he could also assemble and dissolve the legislative body at his will. The courts of justice, civil and criminal, were subjected to his control; the right of pardoning was put into his hands, and the number of the members of the tribunate was limited to half of what it had been. He was to manage the revenues and the expenditure of the state, provide for the safety of the people at home, and for the defence of the country abroad, exercise supreme command over the forces, maintain political connections with foreign countries, confirm all treaties, and in critical times might even suspend the constitution. Thus the first consul united royal dignity with royal authority, and that he might the better retain both, the civil list was increased to 6,000,000 francs (£240,000); and Aug. 15, 1802, the birth-day of the first consul, a consular court was instituted at St. Cloud, and all the former court discipline re-established. Nothing now remained for the complete restoration of monarchy but to make Bonaparte's dignity hereditary in his family by law, as it was already, in point of fact, by his power of naming his successor. On the 10th April, 1804, the tribunate proposed that the first consul should be proclaimed emperor, and that the dignity should be hereditary; this was given effect to by the decision of the senate (18th May). On the first coins struck after Napoleon's elevation as emperor he called himself *Empereur de la République Française*.

III. Since the time of the Crusades officers called *consuls* have existed in different states for the purpose of giving decisions, affording protection, or verifying facts and occurrences relating to maritime and commercial affairs. The Italian states, in particular, took advantage of the Crusades to procure permission from the Asiatic princes to send such persons as protectors of merchants from their own country into the domains of these princes, and their example was followed by other European nations for the protection of their commerce in the Levant and in Africa; and since the fifteenth and sixteenth centuries officers have also been established in European countries to facilitate the intercourse of the respective nations, so that the commercial consuls, both in Europe and other parts of the world, are now very numerous. British consuls were formerly appointed by the crown upon the recommendation of great trading companies or of the merchants trading with a particular place, but they are now directly appointed by government, no such recommendation being necessary. The right of sending consuls to foreign states depends either upon a tacit or express convention. Hence their powers differ widely in the various countries. In some they exercise an extensive jurisdiction over the subjects of the state by whom they were appointed; but the limits of this jurisdiction are controlled by an express convention between the state sending the consul and that to which he is sent, or by custom. Judicial authority is exercised by our consuls only in Turkey, Africa, and with special restrictions in China. The duties of a British consul are thus laid down in the General Instructions for Consuls:—he must 'become conversant with the laws and general principles which relate to the trade of Great Britain with foreign parts; make himself acquainted with the language and municipal laws of the locality, and especially with such laws as have connection with the trade between the two countries.' He must 'protect and promote the lawful trade of Great Britain by every fair and proper means; but at the same time must caution all British subjects against carrying on an illicit commerce detrimental to the revenue and in violation of the laws and regulations of England, or of the nation in which he resides; and he must inform his own government of any attempt at such trading. He must give his advice and assistance when called upon to her majesty's trading subjects, quieting their differences, and promoting harmony and good-will among them, and conciliating as much as possible the subjects of the two countries upon all points of difference which may fall under his cognizance. Should any attempt be made to injure British subjects in person or in property, he must uphold their lawful interests and privileges. The consul must transmit to the secretary of state for foreign affairs, at the end of every year, a return of the trade carried on at the ports within his consulate according to a form prescribed, and send quarterly an account of the current prices of agricultural produce in each week, with the course of exchange, and any other remarks necessary for explaining the state of the market for corn and grain. It is further his duty to

keep his government informed as to the appearance of any infectious disease at the place of his residence. He will relieve any distressed British seaman or other British subjects thrown upon the coast, or reaching by chance any place within his district, and he will endeavour to procure for such persons the means of returning to England. In many cases consuls are subjects of the state by whom they are appointed, but frequently they are natives of the locality to which they are appointed. In some places they are selected from the merchants, and are permitted to carry on trade while exercising the consular functions. Their remuneration is made up of a certain fixed salary calculated according to the importance of the particular appointment and the expense of living in the district, and of certain fees on signing various documents, &c., but these are never of any considerable amount.—CONSUL-GENERAL is a consul appointed for several places or over several consuls.—VICE-CONSULS are officers attached to the consul at an important station, or are those selected from the mercantile class to fill the office in some unimportant locality.

CONSUMPTION, in political economy, is the use and wearing out of the products of industry, or of things having an exchangeable value. This destruction, by putting things to the uses for which they are designed, is very different in different things; nor are the wants of society limited to the use of things having an exchangeable value. The air and the water are as necessary in the economy of life as the earth and its products; and yet neither the air nor water ordinarily bears a price. The latter, however, is sometimes a subject of commerce, especially in large cities; in the city of Madrid, for example. The earth, on the other hand, is a subject of monopoly in all countries where any progress has been made in civilization. But, unlike its products, it is not always deteriorated by use: on the contrary, if skilfully cultivated, its value is increased. In respect to the products, too, there is a difference; some are destroyed, or, in other words, reduced to their elements by use, as provisions. Others, as the precious stones, are not necessarily destroyed by time or use. The metals ordinarily pass through various forms, in a variety of manufactures, before they are wasted and lost in rust; and some products, being destroyed in one form, are converted into materials for use in another. The remnants of linen and cotton fabrics, for instance, supply materials for paper; and so the wood and iron of a ship, on ceasing to be useful, in their combination, for the purposes of navigation, still supply, the one fuel, the other materials for the foundries of iron. The greater the advancement of the arts the more extensively will the remnants of consumption of one kind supply the materials for the production of articles of another form. The arts will even convert the destruction of war into the materials for new production. The bones left on the field of Waterloo are said to have been carefully collected and ground down in order to manure the soil. The increase of population and the progress of the arts introduce a thousand ways of gleaning the relics of one kind of consumption to supply the materials of another. This is one of the absolute gains of resources consequent upon the advance of civilization.

In regard to consumption the remarks and reasoning of Adam Smith have led to some erroneous prejudices, though his positions are in some respects just. He assumes, for instance, that all the stock of society, including the improvements on the lands, are the result of savings, or the excess of the results of labour over the demands for immediate consumption: and this is no doubt true; but the inference which is, and too often, made, that the great object of a nation should be to hoard the fruits of its labour, as the surest means of wealth and prosperity, is by no means true in its full extent. If, for instance, a community has saved the products of its labour to the amount of £100, for which sum it imports from abroad, and introduces into use, a more perfect kind of plough, and the art of making it, or the art of making a better hat, or screw, or saw, with the same labour—the amount saved being expended for this purpose—the numerical possessions, or the computed capital stock of that community, is thereby diminished; and yet the aggregate productive capacity is increased.

This lets us into a principle of national economy which is too frequently overlooked, namely, that the means of prosperity—the national wealth—consists more in the capacity for production than in actual possessions. As far as the capital or nominal wealth consists in the implements of production, and the accommodations for the shelter of the inhabitants, they are both a part of the individual wealth and national resources. But a vast proportion of the productive faculties of a people do not exist in the form of property, and are not marketable articles. Of this description are the arts, and those characteristics of a community which enable the people to maintain good laws and perpetuate their political institutions. All the consumption directed to the promotion of these is in the strictest sense economical, and all the saving of stock which might be devoted to these objects by a consumption for that purpose is a wasteful and short-sighted economy. The great business of society, in an economical view, is production and consumption; and a great production without a corresponding consumption of products cannot for a long time be continued. The notions about the destructive tendency of luxury are therefore preposterous as a general proposition, for it proposes thrift and saving for no purpose. Suppose a whole nation to act literally on the notions inculcated by Dr. Franklin, what would be the result but universal idleness? for, all being intent on saving, that is, on not consuming, there would of course cease to be any encouragement to or demand for production. This is the condition of savage life, imposed by necessity resulting from ignorance, improvidence, and indolence.

To keep the streams of production in active flow, consumption is necessary; and the consumption which directly and steadily promotes production is, in fact, promotive of public wealth. We do not mean to deny that the expenditures of a man who exceeds his means of payment will be injurious not only to himself, but also to the community: for he may annihilate the capital of those who give him credit, and since their industry may depend on their capital, which supplies them with tools to work with, materials to work upon, and a stock of clothing, food, and accommodations, until they can obtain the returns of their industry by a sale of its products, the loss of this capital, by trusting it to one who never pays them, is a destruction of their industry. Hoarding, on the other hand, though not so injurious, yet, if too generally prevalent, may have the effect of paralyzing production, and stifling and enfeebling the economical energies of a people, by diminishing the motives to industry. In a healthy state of the national industry, therefore, the consumption of products should bear a just proportion to production. As long as enough is saved to supply all the increase of demand for a stock of implements and materials, and make all the improvements, of a permanent nature, of which the country is susceptible, such as canals, roads, bridges, &c.—which are, indeed, all

of them only different modes of present consumption of the fruits of labour of various kinds to reproduce others—it is much better, as a general rule, that the remainder of the products of industry should be expended in luxuries than that they should not be produced at all. In regard to luxuries—including in this term all the expenditures made for the gratification of appetite, taste, or vanity—the dispositions of men in general will sufficiently incline them to these. There is no necessity for inculcating the utility of such expenditures as encouragements to industry. Against the importunity of the appetites and desires of men, and against improvidence and thoughtlessness of the future, Dr. Franklin's lessons of economy are of great utility. But looking at the whole mass of society as a great engine of production and consumption we shall inculcate a different set of maxims, based on more comprehensive principles. The example of Dr. Franklin himself would be a practical lesson in this respect; for he was not illiberal of his time, or labour, or money in promoting those expenditures which had the advancement of society for their object. These are often such as gratify no immediate appetite or taste. They look to the future. Their greatest encouragement is the honour which is paid to them by public opinion; for if a man gains more distinction by encouraging a useful or ornamental art, founding a school, or contributing to the construction of a public work, than by riding in a coach, a generous motive is held out to him to turn a part of the general consumption, of which his resources give him the control, into these channels. The tastes and habits of thinking of a people determine the direction of a vast proportion of the general consumption; and the direction and amount of this consumption again determine, in a great degree, those of production.

When we say that production should be encouraged, it is only inculcating, in other words, the maxim that consumption should be encouraged; for the one will, in every community, bear a pretty near proportion to the other; and the object of a liberal, enlightened policy is to swell the amount of both; and the object of a wise and philanthropical policy is to direct them to objects promotive of the physical comfort and moral and intellectual improvement of a people. We are, however, to avoid the error of supposing that all the causes which go to swell the aggregate of production and consumption are beneficial in their operation. If, for example, all the rents of the lands, as under the feudal system, are assigned to a few who by a luxurious and expensive style of living consume the greater part of the produce of the labour of the other members of the community, leaving them no more than barely enough to sustain life and defend them against the elements, though such a community may present a gorgeous exhibition of individual wealth, yet the condition of a great part of its members is little better than that of savages. This was the tendency of society under the feudal system, and all the ecclesiastical systems founded under the auspices of the Church of Rome. The consumption ought to be so distributed as to give every one some just share, in proportion to his labour and services. A precisely equal and just apportionment of the fruits of labour and the profits of the use of the earth cannot be made in any country; for the rights of property must be guarded, or industry will dwindle away. But the laws may do much, and the prevailing habits of thinking and principles and motives of action of a people still more, towards assigning to every kind of industry and every species of talent and skill its fair proportion of the general consumption, and in such a way as not to check but to augment the general mass of things produced and consumed. The benefits of commerce do not consist so much in the mass of wealth which it may be the means of accumulating, or in its directly employing a great many persons, as in the facilities it gives for augmenting the general mass of production and consumption; and in this respect internal commerce in a country of considerable extent and variety of products is far more important than foreign, since the mutual exchanges of the products of labour made among the inhabitants of such a country are much greater in amount than those made between the whole country and other nations.

CONSUMPTION, in medicine, or PHTHISIS (from *phthio*, to consume), a disease known by emaciation, debility, cough, hectic fever, and purulent expectoration. The causes which predispose to this disease are very numerous. The following are, however, the most general:—hereditary disposition; particular formation of body, obvious by a long neck, prominent shoulders, and narrow chest; scrofulous diathesis, indicated by a fine clear skin, fair hair, delicate rosy complexion, large veins, thick upper lip, a weak voice, and great sensibility; certain diseases, such as syphilis, scrofula, the small-pox, and measles; employments exposing particular artificers to dust, such as those of needle-pointers, stone-cutters, millers, &c., or to the fumes of metals or minerals under a confined and unwholesome air; violent passions, exertions, or affections of the mind, as grief, disappointment, anxiety, or close application to study, without using proper exercise; frequent and excessive debaucheries, late watching, and drinking freely of strong liquors; great evacuations, as diarrhœa, and the continuing to suckle too long under a debilitated state; and, lastly, the application of cold either by too sudden a change of apparel, keeping on wet clothes, lying in damp beds, or exposing the body too suddenly to cool air when heated by exercise; in short, by anything that gives a considerable check to the perspiration. The more immediate or occasional causes of phthisis are hæmoptysis, pneumonic inflammation proceeding to suppuration, catarrh, asthma, and tubercles, the last of which is by far the most general.

The incipient symptoms usually vary with the cause of the disease; but when it arises from tubercles it is usually thus marked: It begins with a short dry cough that at length becomes habitual, but from which nothing is spit up for some time except a frothy mucus that seems to proceed from the fauces. The breathing is at the same time somewhat impeded, and upon the least bodily motion is much hurried: a sense of straitness, with oppression at the chest, is experienced; the body becomes gradually leaner, and great languor, with indolence, dejection of spirits, and loss of appetite prevail. A very prominent symptom is clubbing of the finger-ends. When this peculiar conformation of the finger exists, it almost invariably indicates a phthisical tendency. In this state the patient frequently continues a considerable length of time, during which he is, however, more readily affected than usual by slight colds; and upon one or other of these occasions the cough becomes more troublesome and severe, particularly by night, and it is at length attended with an expectoration, which towards morning is more free and copious. By degrees the matter which is expectorated becomes more viscid and opaque, and now assumes a greenish colour and purulent appearance, being on many occasions streaked with blood. In some cases a more severe degree of hæmoptysis attends, and the patient spits up a considerable quantity of florid, frothy blood. The breathing at length becomes more difficult, and the emaciation and weak-

ness go on increasing. With these the person begins to be sensible of pain in some part of the thorax, which, however, is usually felt at first under the sternum, particularly on coughing. At a more advanced period of the disease a pain is sometimes felt on one side, and at times prevails in so high a degree as to prevent the person from lying easily on that side; but it more frequently happens that it is felt only on making a full inspiration, or coughing. Even where no pain is felt, it often happens that those who labour under phthisis cannot lie on one or other of their sides without a fit of coughing being excited, or the difficulty of breathing being much increased.

At the first commencement of the disease the pulse is often natural, or perhaps is soft, small, and a little quicker than usual; but when the symptoms which have been enumerated have subsisted for any length of time it then becomes full, hard, and frequent. At the same time the face flushes, particularly after eating, the palms of the hands and soles of the feet are affected with burning heat; the respiration is difficult and laborious; evening exacerbations become obvious, and by degrees the fever assumes the hectic form. This species of fever is evidently of the remittent kind, and has exacerbations twice every day. The first occurs usually about noon, and a slight remission ensues about five in the afternoon. This last is, however, soon succeeded by another exacerbation, which increases gradually until after midnight; but about two o'clock in the morning a remission takes place, and this becomes more apparent as the morning advances. During these exacerbations the patient is very sensible to any coolness of the air, and often complains of a sense of cold when his skin is, at the same time, preternaturally warm. Of these exacerbations that of the evening is by far the most considerable. From the first appearance of the hectic symptoms the urine is high coloured, and deposits a copious branny red sediment. The appetite, however, is not greatly impaired; the tongue appears clean, the mouth is usually moist, and the thirst is inconsiderable. During the exacerbations a florid, circumscribed redness appears on each cheek; but at other times the face is pale, and the countenance somewhat dejected. At the commencement of hectic fever the belly is usually costive; but in the more advanced stages of it a diarrhœa often comes on; and this continues to recur frequently during the remainder of the disease; colliquative sweats likewise break out, and these alternate with each other and induce vast debility. In the last stage of the disease the emaciation is so great that the patient has the appearance of a walking skeleton; his countenance is altered, his cheeks are prominent, his eyes look hollow and languid, his hair falls off, his nails are of a livid colour, and much incurvated, and his feet are affected with œdematous swellings. To the end of the disease the senses remain entire, and the mind is confident and full of hope. Those who suffer under it are seldom apprehensive or aware of any danger; and persons labouring under its most advanced stage often flatter themselves with a speedy recovery, and form distant projects under that vain hope. Some days before death the extremities become cold. In some cases a delirium precedes that event, and continues until life is extinguished.

The morbid appearance most frequently to be met with on the dissection of those who die of phthisis is the existence of tubercles in the cellular substance of the lungs. These are small tumours, which have the appearance of indurated glands, are of different sizes, and are often found in clusters. Their firmness is usually in proportion to their size, and, when laid open in this state, they are of a white colour, and of a consistence nearly approaching to cartilage. Although indolent at first, they at length become inflamed, and, lastly, form little abscesses or vomicæ, which breaking and pouring their contents into the bronchia, give rise to a purulent expectoration, and thus lay the foundation of phthisis. Such tubercles or vomicæ are most usually situated at the upper and back part of the lungs; but, in some instances, they occupy the outer part, and then adhesions to the pleura are often formed. When the disease is partial only about a fourth of the upper and posterior part of the lungs is usually found diseased; but in some cases life has been protracted till not one-twentieth part of them appeared, on dissection, fit for performing their function. A singular observation, confirmed by the morbid collections of anatomists, is that the left lobe is much oftener affected than the right.

The diet in this disorder should be of a nutritious kind, but not heating, or difficult of digestion. Milk, especially that of the ass; farinaceous vegetables; acescent fruits; the different kinds of shell-fish; the *Lichen islandicus*, boiled with milk, a great quantity of animal soups, and, above all, cod-liver oil, &c., are of this description. It is also of the utmost importance to see that the digestive organs are in proper working order. Some mode of gestation, regularly employed (particularly sailing) warm clothing, removal to a warm climate or to a pure and mild air, may materially concur in arresting the progress of the disease in its incipient stage. With regard to urgent symptoms requiring palliation, the cough may be allayed by demulcents, but especially mild opiates swallowed slowly; colliquative sweats by acids, particularly the mineral; diarrhœa by chalk and other astringents, but most effectually by small doses of opium.

CONTACT, in astronomy, a word used in describing eclipses of the sun and moon, and also the transits of the inferior planets. In a solar eclipse contact takes place at the instant when the limbs of the sun and moon just touch each other either exteriorly or interiorly; in a lunar eclipse, when the shadow of the earth just touches the limb of the moon; and in the case of a transit of Venus or Mercury, when the limb of the planet just touches the sun's limb either exteriorly or interiorly. The instant of *interior* contact and of *exterior* contact are distinguished by these names.

CONTACT ACTION. A mixture of hydrogen and oxygen gases can be kept for any length of time without change, but if a piece of spongy platinum be introduced into the mixture, in a very short time the gases combine with explosion. The platinum, which is found unchanged, is said to have acted by its presence or by contact, and the cause was ascribed to a peculiar force, called by Berzelius *catalytic*, the whole phenomenon being denoted by the term *catalysis*. There are many other examples of bodies inducing combination or decomposition, without themselves apparently altering, but extended study of the whole subject renders it probable that in some cases the neutrality is only in appearance, the catalytic body really undergoing successive combination and decomposition, while in others, as in that given above, a modification of the physical circumstances is produced, sufficient to determine the chemical change. There is no necessity therefore for assuming the existence of a peculiar force, though in individual instances it may not be at once obvious to what cause the effect is to be ascribed.

CONTAGION (*contagio*, from *contango*, to meet or touch each other). This word properly imports the application of any poisonous matter to the body

through the medium of touch. It is applied to the action of those very subtle particles arising from putrid substances, or from persons labouring under certain diseases, which communicate the diseases to others; as the contagion of putrid fever, the effluvia of dead animal or vegetable substances, the *miasmata* of bogs and fens, the *virus* of small-pox, *lues venerea*, &c. &c. The principal diseases excited by poisonous *miasmata* are—intermittent, remittent, and yellow fevers, dysentery and typhus. The last is generated in the human body itself, and is sometimes called the *typhoid fomes*. Some *miasmata* are produced from moist vegetable matter, in some unknown state of decomposition. The contagious *virus* of the plague, small-pox, measles, chincough, *cynanche maligna*, and scarlet-fever, as well as of typhus and the jail fever, operates to a much more limited distance through the medium of the atmosphere than the marsh *miasmata*. Contact of a diseased person is said to be necessary for the communication of plague; and approach within two or three yards of him for that of typhus. The Walcheren *miasmata* extended their pestilential influence to vessels riding at anchor, fully a quarter of a mile from the shore. When disease is communicated through the atmosphere, *infection* is the proper word to employ. This distinction is necessary, as some diseases, such as cholera, are not infectious, though very contagious.

The chemical nature of all these poisonous effluvia is little understood. They undoubtedly consist, however, in every individual case, of a specific virus; in some cases, such as ague, this is demonstrated to be a minute fungus, and, most probably, always of an organism which is capable of propagating itself where it finds a proper nidus. *Antiseptics*, or disinfectants, are the names given to substances which, when diffused throughout the atmosphere, destroy the poisonous particles. The most reliable of these are carbolic acid, sulphur, permanganate of potash, chloralum, chlorine gas, and, above all, plenty of pure air.

There does not appear to be any distinction commonly made between contagious and infectious diseases. The infection communicated by diseased persons is usually so communicated by the product of the disease itself; for instance, by the matter of the small-pox; and therefore many of these diseases are infectious only when they have already produced such matter, but not in their earlier periods. In many of them contact with the diseased person is necessary for infection, as is the case with the itch, syphilis, canine madness; in other contagious diseases even the air may convey the infection, as in the scarlet-fever, the measles, the contagious typhus, &c. In this consists the whole difference between the fixed and volatile contagions.

A real infection requires always a certain susceptibility of the healthy individual; and many infectious maladies destroy for ever this susceptibility of the same contagion in the individual, and, accordingly, attack a person only once, as the small-pox, measles, &c. Other contagious diseases do not produce this effect, and may, therefore, repeatedly attack the same person, as typhus, itch, syphilis, and others. Sometimes one contagious disease destroys the susceptibility for another, as the cow-pox for the small-pox. In general, those parts of the body which are covered with the most delicate skin are most susceptible of contagion; and still more so are wounded parts deprived of the epidermis. Against those contagious diseases which are infectious through the medium of the air precautions may be taken by keeping at the greatest possible distance from the sick, by cleanliness and fearlessness; but most completely by the vigilance of the health-officers, by fumigations according to the prescriptions of Guyton-Morveau, &c. We can more easily secure ourselves against such contagious diseases as are infectious only in case of contact, by means of cleanliness, caution in the use of vessels for eating and drinking, of tobacco pipes, of wind-instruments, beds, and clothes. No general preservative against contagious diseases is known, though many are offered for sale by quacks. The examination of the persons intended for nurses and tenders of infants is very necessary, as thousands of children may be infected by contact with them, and the cause of the disorder remain unknown. See EPIDEMIC.

CONTAGIOUS DISEASES ACTS. Acts for the prevention of contagious diseases at certain naval and military stations were passed in the years 1864 and 1866, and amended 1868 and 1869. The substance of these acts is as follows:—Certified hospitals for the reception of women labouring under venereal diseases are to be established at Portsmouth, Plymouth, Woolwich, Chatham, Sheerness, Aldershot, Colchester, and Shorncliffe in England; and the Curragh, Cork, and Queenstown in Ireland. An inspector of hospitals is to be appointed for each place. After a declaration made before a magistrate, a woman may be compelled to appear before the medical officer, who, if the accusation is well founded, is to commit her to the hospital for a period not exceeding three months, or until her cure is effected. Insubordination or refusal to be examined is punishable with imprisonment; and keepers of houses of ill-fame who knowingly harbour any such women are subject to a fine. The acts are not to come into operation until after an hospital has been established, and the expenses are to be defrayed by the Admiralty Board and the Secretary of the War Department. The framers of these acts have been charged with smuggling them through Parliament by various devices, and, in 1870, associations were got up throughout the country to procure their repeal. About the end of that year a commission was appointed to inquire into the working of the acts; and, in 1872, the Home Secretary introduced a bill to modify the more stringent clauses; it was thrown out, however, about the middle of July.

CONTAGIOUS DISEASES (ANIMALS) ACT. Towards the end of June, 1865, the disease known as *Rinderpest* (the German for cattle-plague) broke out in a cowhouse at Islington, and rapidly spread over the whole country, invading Scotland before the completion of the following month. The government issued a commission from the crown authorizing certain persons therein named to investigate the nature and origin of the disease, and to report on the mode of treatment best adapted for the cure of infected animals, and the regulations proper for preventing the spread of the plague. Guided by the report of the commissioners, orders were issued from the privy-council regulating the movements of cattle, sheep, goats, or swine within England and Scotland (Ireland was not visited by the disease). But it was not until the 9th August, 1869, that an act was passed which consolidated and made perpetual the regulations for preventing the introduction and spread of contagious disease. The act vests extensive powers in the privy-council, which receives the power of restricting and prohibiting the movement of cattle and other animals within the kingdom; of prohibiting the import of cattle from any country into any port; of prescribing from time to time the countries from which cattle may be brought; and of defining areas at ports into which cattle may be brought, but from which they cannot be taken alive. Local authorities are also empowered to take means for preventing the spread of the disease by the erection of sheds, wharves, and

slaughter-houses where necessary, and are further required to appoint an inspector and other officers for their districts to see to the proper carrying out of the act. Upon the report of their inspector, to whom power is given to enter any place where disease is suspected, and whose certificate is to be taken as conclusive evidence before a court of justice, the local authority is to compel the slaughter of any animal affected, or in contact with those affected; to grant compensation for all animals suffering from the disease to the amount of half the value of the animal before affected, not, however, to exceed £20; and for all animals in contact three-fourths of their value, but not to exceed £30. Instructions are given in the act for the burying of all slaughtered animals in their skins, for the disinfection of all places occupied by them, and the destruction of all hay, corn, and fodder on such premises. Railway and steamboat companies are required to disinfect trucks, boxes, and boats; and water and food must be provided for animals travelling by rail at certain stations on the line.

CONTARINI, a noble family of Venice.—DOMENICO, doge of Venice from 1043 to 1071 or 1073. He rebuilt Grado, and reduced the city of Zara, which had revolted.—JACOPO, doge from 1075 to 1080. Under his reign the Venetians forced the city of Ancona to acknowledge their sovereignty over the Adriatic Sea.—ANDREA, doge from 1367 to 1382. The Genoese, under Pietro Doria, had conquered Chiozza in 1379, and threatened even Venice. Andrea Contarini reconquered Chiozza, captured the Genoese fleet, and delivered the republic from its enemies (1380).—FRANCESCO, doge from 1623 to 1625. Under him Venice, in alliance with Louis XIII. of France, the Duke of Savoy, and the Protestant cantons of Switzerland, reconquered the Pays de Vaud in 1624, which the Austrians had taken possession of.—CARLO, doge from 1655 to 1656. Under his reign Lazaro Mocenigo, admiral of the republic, in June, 1655, gained a brilliant victory over the Turks in the Dardanelles.—DOMENICO, doge from 1659 to 1674. During his government Venice resisted for five years the attacks of the Turks on the island of Candia; but on September 26, 1667, after a siege and defence of unexampled obstinacy, Francesco Morosini surrendered the island.—AMBROGIO, from 1473 to 1477, was ambassador of the republic at the court of the King of Persia, Usun Kassan. The interesting description of his residence at this court first appeared at Venice, in 1487, in Italian.—GASPARO negotiated a permanent peace between the republic and Charles V. in 1529. Pope Paul III. conferred on him the cardinal's hat in 1535. In 1541 he was Papal legate at the Diet of Ratisbon, where he distinguished himself by his moderation. After his return he was sent as legate to Bologna, where he died in 1542.—GIOVANNI (born at Venice, in 1549; died in 1605) was one of the most distinguished painters of his age, worked in the style of Titian, and was particularly skilful in painting ceilings; for example, his Resurrection in the church of St. Francesco di Paolo, in Venice.—VINCENZO, born at Venice in 1577, died in 1617; a scholar whose reputation was in early life so great, that the magistrates of Padua established a new chair of Latin and Greek eloquence only to retain the learned youth of twenty-six years of age in their city. He lectured there until 1614.

CONTÉ, NICHOLAS JACQUES, a painter and chemist, but particularly distinguished for the ingenuity of his mechanical contrivances, was born at St. Cernerey, near Séez (department of Orne), August 4, 1755, and died at Paris, December 6, 1805. His mechanical genius was displayed at the age of twelve years by the construction of a violin (which was used at several concerts) with no other instrument than a knife. At the age of eighteen, without having received any instructions, he executed several paintings for the hospital of Séez. This success did not prevent him from the cultivation of the physical and mathematical sciences. He went to Paris, and invented a hydraulic machine, which was mentioned with approbation by the Academy of Sciences. In 1793 he was appointed one of the committee for making experiments in regard to the decomposition of water by iron instead of sulphuric acid; and he was the first to propose the use of balloons for military purposes, and the success of the experiment at the battle of Fleurus occasioned his appointment of director of the aerostatic school at Meudon. Conté suggested the idea of establishing a place of deposit for useful machines, tools, &c., in consequence of which the conservatory was instituted. He afterwards introduced the manufacture of an excellent kind of crayons into France, and established a great manufactory, which still supplies all France with them. A gold medal was awarded to him for this invention. He was appointed in 1798 to accompany the French expedition to Egypt, and his services were of the greatest value. He constructed a furnace on the Pharos, near Alexandria, in the space of two days, for red-hot balls, with which the British were repelled, and thus time was given for fortifying that place. The machines and instruments of the army having been lost by the sinking of the fleet at Aboukir, Conté was obliged to furnish everything, even the tools: he constructed wind-mills, machines for the mint at Cairo, for an oriental printing establishment, for the fabrication of gunpowder, &c., and cannon foundries; manufactured steel, paper, swords for the soldiers, utensils for the hospitals, instruments for the engineers, telescopes for the astronomers, microscopes for the naturalists, drums, trumpets, in short, everything necessary for such a military and scientific expedition in such a country as Egypt. On his return to France he was appointed to superintend the execution of the great work on Egypt, and invented a graving machine, which, by performing certain parts of the labour, spared the artist much time and trouble. The death of his wife, to whom he was tenderly attached, threw him into a lingering disease, and he survived her but a short time. Conté was a member of the Legion of Honour. His statue was inaugurated at Séez, Oct. 2, 1852.

CONTEMPT. Legislative bodies and judicial tribunals are generally invested with power to protect themselves against interruption; and such a power is essential to enable them to conduct their business. They are usually empowered to commit persons to prison, or punish them otherwise, for disturbances and contempts. A legislative body may punish one of its own members for disorderly behaviour as well as a by-stander. Judicial tribunals have the same power. The French penal code, article 222, &c., provides that when any executive or judicial officer shall, during or on account of his official duties, be insulted, the person guilty of the outrage shall be punished by an imprisonment of not less than two months nor more than two years, unless the offence is committed in open court, in which case the imprisonment is not less than two nor more than five years. Blackstone says in the fourth volume of his Commentaries that process for contempt is 'an inseparable attendant on every superior tribunal; and accordingly we find it actually exercised as far back as the annals of our law extend.' This power has a much broader construction in Britain than in America, being confined in the latter country, mostly at least, to the cases of actual disturbance and

flagrant disrespect to the court, or an attempt to influence a decision by popular appeals, or direct and high-handed or outrageous resistance to, or obstruction of its proceedings or processes; whereas, in Britain, it extends to acts or omissions which do not directly disturb the judicial proceedings; such, for instance, as not paying a bill of costs awarded by the court; not obeying the summons of a court of equity, and not answering a bill; refusing to be sworn as a witness, which has also been held to be a contempt in the United States. Serving a process on an attorney while attending court has been held to be a contempt of the court in Britain; likewise shouting or giving applause in court on a return of a verdict by a jury. It was held in New York to be a contempt of the court to bring a suit in the name of another without his consent. It is a contempt to endeavour by writings or publications to prejudice the public mind, or that of a jury, or the court, in a cause pending in court. This is not only an attack upon the public administration of justice, but also upon the right of the individual parties in the suit, since it would be in vain to provide by law that no party shall be adjudged or condemned without a hearing if practices are permitted which tend to deprive him of a fair hearing. The party may be charged with contempt, either on the view of the court, that is, without taking the testimony of witnesses, for misdemeanours committed in presence of the court, or on the testimony of witnesses; and he is always heard in his own defence, provided he observes decorum in making his defence. The process is necessarily summary, since the cases are generally such as require immediate interposition, and courts do not usually resort to it except in palpable and flagrant cases.

CONTENT AND NONCONTENT are the words by which assent and dissent are expressed in the House of Lords. AYE and NO are used in the House of Commons.

CONTESSA, CHRISTIAN JACOB SALICE, a German writer, born at Hirschberg in Silesia in 1767, and died in 1825. He is author of the novel Almanzor. —KARL WILHELM SALICE CONTESSA, brother of the preceding, born in 1777, at Hirschberg, studied at Halle, and died at Berlin, June 2, 1825. He wrote tales and comedies. Von Houwald, likewise a German poet, published his works in 1826. Hoffmann has described Contessa's character in a masterly manner, under the name of Sylvester, in his Serapionsbrüder.

CONTI, ANTONIO SCHINELLA, a Venetian patrician whose mathematical researches attracted the attention of Newton, was born at Padua in 1677. He gave up the clerical profession, because he disliked to hear confessions. He visited Paris, and in 1715 London, where he was elected a member of the Royal Society on the proposal of Newton. Here he became involved in the controversy between Newton and Leibnitz, and by attempting to avoid displeasing either of them dissatisfied both. By chance Conti came into possession of a manuscript which contained Newton's system of chronology. From his hands it passed into those of Freret, who published it, with severe notes. Newton was much displeased with Conti's share in the transaction. In 1718 Conti went to Paris, and in 1726 feeble health obliged him to return to the milder sky of his own country. He lived mostly in Venice, entirely devoted to his literary occupations, which included poetry. He died at Padua in 1749.

CONTINENTAL SYSTEM was a plan devised by Napoleon to exclude Britain from all intercourse with the continent of Europe. The history of the continental system begins with the famous decree of Berlin of November 21, 1806, by which the British Islands were declared to be in a state of blockade; all commerce, intercourse, and correspondence were prohibited; every Briton found in France, or a country occupied by French troops, was declared a prisoner of war; all property belonging to Britons, fair prize, and all trade in British goods entirely prohibited. No vessel coming directly from Britain or British colonies, or which had been there since the publication of the edict, was to be admitted into any harbour, and all vessels attempting to avoid this edict by false declarations were to be confiscated, with all their goods, as British. The reasons assigned for this decree were, that Britain did not acknowledge the international law accepted by civilized nations, but treated every individual belonging to the country of the enemy as if found in arms; made even the crews of merchantmen prisoners of war; extended the right of conquest over merchantmen and private property, and the right of blockade over places and harbours not fortified; over the mouths of rivers; nay, over whole coasts and countries. But many of these measures had always been taken, in maritime wars, even by France herself, as long as she had the means. One great reason for this and all the subsequent decrees of Napoleon was, that he considered Britain his inveterate enemy, and the enemy of the political doctrines which took their rise from the revolution.

Britain immediately directed reprisals against the Berlin decree, first by an order in council of Jan. 7, 1807, by which all neutral vessels were prohibited to sail from one port to another belonging to France, or one of her allies, or to a nation so much under her control that British vessels could not have intercourse with it. Every neutral vessel which should violate this order was to be confiscated, with her cargo. A second decree of Nov. 11, 1807, was much more oppressive to commerce. By this, all harbours and places of France and her allies, in Europe and the colonies, as likewise every country with which Britain was at war, and from which the British flag was excluded, were subjected to the same restrictions as if they were closely blockaded; all commerce in the manufactures and productions of such countries was prohibited, and vessels engaged in such commerce were to be confiscated, as also all those vessels whose certificates showed that they were built in the enemy's country. Another order in council declared the sale of vessels by the enemy to neutrals unlawful, and the intended transfer of property void.

Hardly were these orders promulgated when France made counter reprisals. By a decree of Milan of Dec. 17, 1807, aggravated by a decree of the Tuileries, Jan. 11, 1808, every vessel, of whatsoever flag, which had been searched by a British vessel, and consented to be sent to Britain, or had paid any duty whatever to Britain, was to be declared *denationalized*, and to have become British property; and, in every case, such denationalized vessel, as also those which had broken the blockade declared against the Ionian Islands, or had sailed from a British harbour or British colony, or those of a country occupied by the British, or which were destined for any such ports, were declared good prize. In order the more effectually to annihilate the British commerce, the tariff of Trianon, respecting colonial goods, was proclaimed Aug. 3, 1810. This was extended by another decree of Sept. 12 of the same year, and both were followed by the decree of Fontainebleau, Oct. 18 of the same year, directing the burning of all British goods. These decrees were to be executed with more or fewer modifications, in all countries connected with France. The consequence was that the price of colonial goods rose enormously; a regular smuggling trade was car-

ried on at different points; for instance, at Heligoland, which was sometimes so crowded with persons concerned in this business, that a ducat was paid for a barrel to sleep in; thousands of substitutes for colonial goods, particularly for coffee and sugar, were invented, and a variety of manufactures grew up on the Continent which were the germs of very extensive and flourishing branches of industry. The system was abolished immediately after the fall of Napoleon.

CONTINGENT, the name often given to the quota of troops which is to be furnished by each member of a number of states composing a confederation.

CONTINUITY OF LIQUID AND GASEOUS STATES OF MATTER. See MATTER (CONTINUITY, &c.)

CONTORNIATI, ancient medals which have occupied the attention of antiquarians for a long time, and, on account of their rarity, are highly esteemed in cabinets. They are formed of a thin plate of metal (not of two different sorts, as is often supposed) with a flat impression. They differ from other ancient coins by having a furrow upon both their sides, where the others have a wreath of pearls. These hollowed lines (in Italian, *contorni*) may have occasioned their name. Another characteristic of genuine *contorniati* is a cipher composed of the letters EP or PE, of which no satisfactory explanation has, as yet, been discovered, together with numerous impressed characters, and a great number of palm branches, the cavities of which are often filled with silver. They are also added by a second hand, and thereby are essentially distinguished from the *monograms*, so called in the language of the mint. They resemble the *signa incusa* (*contremarques*) on the Roman medals. All the *contorniati* are of bronze, and equal in size to the large bronze coins called *medaglioncini* by the Italian collectors. Their form is various, their workmanship rude, and their inscriptions are frequently different from the usual curial style upon the ancient coins. From these circumstances we may conclude that they did not belong to the age of the Roman emperors whose images they bear, but to a later one. Eckel, in his masterly treatise on the *contorniati*, follows the opinion of Morelli and Mahudel, who consider them to have been made from the reign of Constantine the Great to that of Valentinian. It has been ascertained that they were not struck by public authority; and the ancients have transmitted no account of their destination, which must, therefore, be left to conjecture. The frequent representations of race-grounds, palms, men shouting to the charioteers, and even the images of the emperors upon them, make it probable that they were distributed as tickets of admission to the circuses in Rome and Constantinople.

CONTOUR. See OUTLINE.

CONTRABAND, in commerce, all goods and wares exported from or imported into any country, against the laws of said country. There are, also, a number of articles termed *contraband of war* which neutrals may be prevented, by one belligerent, from carrying to another. What is to be considered contraband of war depends upon existing treaties. These, however, have not settled, with much precision, the articles embraced under this term. Indeed, before the *Consolato del Mare* of the Italian mercantile states, the subjects of many powers were forbidden to furnish their enemies with arms. The rule was afterwards established that a belligerent power might prevent neutrals from supplying its enemy with munitions of war; hence the name *contraband* (*contra bannum*) was introduced. Subsequently the term *contraband* was extended so as to embrace articles out of which munitions of war were made. All other articles, however, even such as might be useful to the enemy, such as grain, wine, provisions, money, &c., were allowed to pass free, a few only being excepted, by particular treaties (as, for instance, in the compact between France and Spain in 1604, in the treaty between England and Holland in 1654, &c.) Subsequently, however, the number of articles styled *contraband of war* was prodigiously increased. Many belligerent powers in the war which broke out near the end of the last century, gave a partial and arbitrary construction to the term—for instance, Britain and Russia, in 1794, who wished to prevent neutral powers from supplying France with corn; and the might of Britain enabled her to enforce her own construction, which made such articles, for example, as salted meat contraband, under the pretext that it could only be intended for garrisons and ships' crews. 'The catalogue of contraband,' says Lord Stowell, 'has varied very much; sometimes in such a manner as to make it difficult to assign the reason of the variations, owing to particular circumstances, the history of which has not accompanied the history of the decisions. The king is bound to watch over the safety of the state; he may, therefore, make new declarations of contraband when articles come into use, as implements of war, which were before innocent. This is not the exercise of discretion over contraband. The law of nations prohibits contraband, and it is the *usus bellici*, which, shifted from time to time, make the law shift with them. The greatest difficulty seems to have occurred in the instance of provisions, which have not been held, universally, contraband, though Vattel admits that they become so on certain occasions, when there is an expectation of reducing the enemy by famine. In modern times, one of the principal criteria adopted by the courts for the decision of the question, whether any particular cargo of provisions be confiscable as contraband, is to examine whether those provisions be in a raw or a manufactured state. Articles are treated with greater indulgence in their native condition than when they are wrought up for the convenience of the enemy's immediate consumption.' Of late the practice of treating provisions as contraband of war, when asserted at all, has been, undoubtedly, less strict. The belligerent has exercised the right of pre-emption only—a right of purchase with a reasonable compensation to the individual whose property has been diverted by the act of the belligerent from its original destination. Every state determines for itself what articles shall be deemed contraband in the way of trade; for the most part, on the principle that nothing shall be imported which the country itself produces in abundance, and nothing exported but that which exceeds its own consumption. See SMUGGLING.

CONTRABASSO, the Italian name, now usually employed by musicians of all nationalities to designate the largest instrument of the violin kind (called sometimes the *double bass*). In England, France, and Italy this instrument has three strings which are tuned in fourths, the lowest, sounding the A, seated on the third added line below the bass staff. The Germans add another string which gives E, a fourth lower than the above A.

CONTRACT, an agreement or covenant between two or more persons, in which each party binds himself to do or forbear some act, and each acquires a right to what the other promises. Contracts may be in express terms or implied from the acts of the parties; they may be verbal or written, and at common law both forms are binding; but by statute law a promise must be in writing, and signed by the party to be sued:—1st, when it was not to be performed within a year of the date of the contract; 2d, when

offered as security for a third party; 3d, when it is made in consideration of marriage, except mutual promise to marry; 4th, in cases of sales of goods above a certain value (£10 in England and 50 dollars in the United States); and 5th, when the contract is for the sale of lands or interest in lands, or for a lease extending over more than a year. To be valid a contract must have been entered into by competent parties. The party to be sued must have been of sound mind, and of full age (twenty-one years), unless it was for the supply of necessaries, which can, however, be recovered at value, not at contracted price; if by a woman, she must have been unmarried. The act contracted for must not be contrary to law or public policy; and must be beneficial to the party seeking compensation. There must have been neither fraud (by concealment or mis-statement) nor compulsion on the part of the plaintiff, and fraudulent acts subsequent to the agreement having reference to it are sufficient to deprive the party guilty of them of all right under it. Intoxication was formerly held not to constitute an exemption from liability upon a contract made while in that state, but it is now held that a contract is void in all cases where the person at the time of making it was incapable of understanding the nature and extent of the instrument, no matter what may have caused such incapability. Such are the general requisites to the validity of contracts; but the extent of the right and liability arising under them differs according to their form. Agreements are divided into those under seal, called agreements of specialty, and those not under seal, which are called simple contracts, and which include not only all verbal, but also all written contracts if unsealed. All sealed contracts continue in force for twenty years; unsealed are binding for six years only. The first sort are alone binding upon the land, and only so when the heir is named. Both classes are either a promise to pay a certain sum stated in the agreement, or an uncertain sum according to the value of the thing received; or they are agreements to do certain things. In the first case the remedy is by action of debt on bond or on simple contract, as the case may be; in either of the latter cases the remedy is by action for breach of covenant where the agreement is under seal or by action of assumpsit where it is by simple contract. The relief given in the last two mentioned kinds of action is compensation in damages for the injury arising from non-performance of the agreement.

CONTRACT, ORIGINAL or SOCIAL, in politics, that which is supposed to exist from the beginning between the sovereign power and the subject. At the period of the English revolution of 1688 the Convention Parliament charged James II. with having 'broken the original contract between the king and the people.' The original contract, with the reciprocity of rights and duties which it suggests, is evidently a mere supposition, having no historical foundation in any annals which have been preserved. It is, however, the only base on which men can construct a theory of government which shall satisfy the moral as well as the economical wants of society.

CONTRALTO, in music. This Italian term is now generally adopted by English musicians to denote the lowest range of female voices. The easy compass is two octaves starting from the upper D or E in the bass cleff. It stands thus about a third higher than the highest pitched tenor voices. It betokens a low state of musical culture in a vocalist when he seeks to rival the soft, firm, and dignified tones of the contralto, with his thinnest notes painfully produced under extreme pressure, often taking refuge in the unmanly falsetto.

CONTRAVALLATION, a line formed in the same manner as the line of circumvallation, to defend the besiegers against the enterprises of the garrison, so that the troops carrying on the siege lie between the lines of circumvallation and contravallation. As the line of contravallation must be out of reach of cannon-shot from the place besieged, its circumference is necessarily so great as to render both its erection and its defence difficult. It is, therefore, seldom resorted to, and a corps of observation is generally preferred.

CONTRAVENTION, an act done in violation of a legal obligation or condition; most frequently applied in Scotch law to any act done by an heir of entail in opposition to the deed of entail, or to the action founded on a breach of lawburrows.

CONTUMACY. The Latin term *contumacia* is used on the continent of Europe to express the offence of non-appearance in court of a person summoned judicially. In civil causes a person in such case may be properly made liable to a decision against him, for his neglect in not appearing to defend his rights; but by an extension of the principle to criminal cases, persons are often sentenced, in their absence, to punishment *in contumaciam*, as it is called, particularly those who are charged with political offences, who can expect little justice under despotic governments. Such sentences are manifestly unjust, since an innocent person ought not to suffer punishment, even if he courts it, and neglects the means of defence. Sentences *in contumaciam* in criminal offences, therefore, are generally set aside, if the accused person appears and submits to trial. During the political commotions in Prussia, Austria, Italy, Spain, and France, a great number of sentences *in contumaciam* took place, and even sentences of death were pronounced on this ground. See CONTEMPT.

CONVALLARIA. The *Convallaria majalis* or Solomon's seal contains two bodies, convallarin and convallamarin. Both are white and crystalline, convallarin not soluble in water, but soluble in spirit; convallamarin readily soluble in both. Convallamarin has a sweetish bitter taste, and is an active poison, affecting the heart like digitalin. Convallarin does not act in this manner. Lily of the valley (*Convallaria multiflora*) also seems to contain an active principle.

CONVECTION OF HEAT, the transference of heat by means of the upward motions of the particles of a liquid or gas which is heated from beneath. With practically one exception, namely, water below its maximum density point, liquids and gases increase in volume on being heated, and their densities therefore decrease. Hence if heat be applied beneath a vessel containing a liquid or a gas, the parts nearest to the bottom, becoming heated, rise up owing to their diminished density, their place being taken by cooler fluid rushing in from the sides and falling down from the upper parts of the vessel. Hence a rapid mixing takes place, and it is thus that a liquid heated at the bottom becomes so much more quickly warmed than it would be were the heat applied at the top. The convection currents may be beautifully shown by filling a flask of glass with water, and dropping into it a small bit of indigo or other such solid colouring matter. On placing the flask over a spirit-lamp, streams of heated liquid will be seen rising and carrying the blue particles; while at the same time the cool water uncoloured will be observed falling in downward streams and taking the place of that which is rising.

CONVENT, a religious house inhabited by a society of monks or nuns.

CONVENTICLE, a private assembly or meeting for the exercise of religion. The name was at first

given as an appellation of reproach to the religious assemblies of Wickliffe, and afterwards applied to meetings of petty sects and dissenters generally in the Conventicle Act, 22 Charles II. cap. i. repealed by 52 George III. cap. clv. *Conventicle* in strict propriety denotes an unlawful assembly, and cannot therefore be justly applied to the legal assembling of persons in places of worship, certified or licensed according to the requisitions of law.

CONVENTION (from the Latin *conventio*, a meeting). The word, in a political sense, is generally used for a meeting of delegates convened without the ordinarily recognized authority, for a special purpose. The English Parliament can only be convened by the authority of the sovereign, and on two occasions when the crown was in abeyance, in 1660 when Charles II. was restored, and in 1688 when the throne was left vacant by the flight of James II. and William of Orange and Mary were presented with the crown, the expedient of convention parliaments was resorted to, their enactments being ratified by subsequent parliaments convoked by the legal method of king's writs. The assembly which met in Edinburgh, March, 1689, and conferred the Scottish crown on William and Mary, was entitled the Convention of Estates. In French history the name National Convention is applied to that body which met after the Legislative Assembly had pronounced the suspension of the royal functions (Sept. 1792), and proclaimed the republic at its first sitting. In America the term is not only applied to voluntary assemblies of delegates having some change of legislation or policy in view, but to delegated bodies specially convened by the authority of one or more state legislatures.

CONVERSANO, a town in South Italy, in the province of Bari, and 18 miles S.E. of the town of Bari, agreeably situate on a hill. It is the seat of a bishop, and has a citadel, a handsome cathedral, several convents, a diocesan seminary, and an hospital. The district produces wine, oil, almonds, flax, and cotton; and a good trade is carried on in these articles. The foundation of the town is attributed to the Etruscans. Pop. 9731.

CONVERSATION, the oral interchange of ideas among two or more persons. The art of conversation may be said to have been of Athenian origin. In Athens the greater part of a citizen's life was passed in public, in the principal squares of the city, in the theatre, in the academy, in the agora or the banqueting saloon. To the light-spirited, volatile, and witty Athenian every topic was fair game, the merits of a tragedy or comedy, the marriage of Pericles and Aspasia, the effects of the last Macedonian victory, the family jars of Socrates and Xantippe, philosophy, art, and religion; every subject, in short, that could satisfy curiosity, enlighten, or amuse. In the public square the poorest citizen could listen to a discussion between Socrates and an opponent, to the orations of Demosthenes, or the railings of Diogenes. Here he found the information and mental training which placed him on a par with his modern representative, whose intellectual wants are supplied by the daily newspaper. The art was lost with the fall of Athens, and was only partially recovered by the Romans under the auspices first of Cicero and then of Augustus. Then followed times when men were afraid to converse, for the emperors grew suspicious and cruel, and walls had ears. The art was for a long time unknown, but began once more to flourish in the brilliant courts of Ferara, Urbino, Florence, or Rome. Thence it travelled to France, and there, according to most authorities, it has continued to stay. The court of Louis XIV., the Hôtel de Rambouillet, are celebrated for the influence they had on polishing, purifying, and fixing the French language. In the eighteenth century the salons of Madame de Tencin, Madame Geoffrin, and Madame du Deffand were rendered famous by the sparkling conversations of such men as Voltaire, Diderot, Chamfort, Duclos, Piron, D'Alembert, &c. It is without doubt when the pleasures of those assemblies were revolving in the mind of Rousseau that he gave the following description of conversation:—'The tone of good conversation is flowing and natural, and neither heavy nor frivolous: it is learned without being pedantic, gay without being boisterous, polished without being affected, gallant without being insipid, jocose without being equivocal. It deals not in dissertations or epigrams, conforms to the demands of good taste, without being bound by rule; unites wit and reason, satire and compliment, without departing from the rules of a pure morality; and allows all to speak on subjects which they understand. Each one expresses his opinion, and supports it in as few words as possible; and no one attacks that of another with warmth, or upholds his own with obstinacy. All impart information, and all are entertained.' The French themselves admit that the art has ceased to flourish in Parisian circles, and we must therefore conclude it is dying out, as they add that it is unknown to the Italians, whose ideas are expressed in pantomime and exclamation; to the Germans, who treat each other to philosophical dissertations; and to the English, who are eternally debating over political, social, and moral economy. The decline of the art is set down, first, to the fact that women are not so able to take part in good general conversation as formerly; and, secondly, that we get all matters of fact and speculation so regularly supplied and discussed in the daily prints that nothing is left to talk about.

CONVEX (from the Latin *convexus*, vaulted, arched), rising in a circular form; the contrary to *concave*. Thus the inside of a watch-glass is concave, the outer surface convex. The mathematician defines a curved line convex on the side on which the point of intersection of two tangents falls, and concave on the opposite side.—Convexity and concavity are of particular importance in catoprics and dioptrics, as applied to mirrors and lenses.

CONVEX LENS. See LENS.

CONVEYANCE, in law, is the transfer of the title to lands or hereditaments. There are different kinds of conveyance at common law, as by feoffment and livery (making a deed of the land in fee, and putting the grantee into possession); by lease and release (granting a term of years, or other limited right of possession of the land, and then relinquishing the remainder to the lessee after he has taken possession); by grant, which was first used in regard to incorporeal hereditaments (such as the right of receiving a certain perpetual rent, or appointing a clergyman to a particular church), where no livery of seizin and actual possession could be given, but was subsequently applied to corporeal hereditaments; or, finally, by bargain and sale, which is, in fact, a species of grant. (See BARGAIN AND SALE). Such were the modes of conveyance by the common law; but the introduction of uses and trusts made a great revolution in the modes of conveyance in England. The feoffment to uses was first introduced, whereby the fee of the land was granted to one person for the use or benefit of another. The statute of 27 Henry VIII. was passed to prevent this species of conveyance by enacting that where it was made the fee should pass to the person for whose benefit the grant was made, that the effect should be the same as if the conveyance had been made to him directly. To evade this statute trusts were invented whereby the land was conveyed to one, for the use of another, in trust for a third; and the courts, favouring this

evasion of the statute, held that in such case the fee would pass to the second to be held for the use and benefit of the third, thus effecting, by the intervention of another party to the conveyance, what the statute was intended to prevent. This contrivance has rendered the system of conveyancing very intricate and complicated in England; but the whole system has been very much simplified by an act passed in 1834. Scotch conveyancing was simplified by statutes passed in 1847.

CONVOCATION, an assembly of the clergy of England, belonging either to the province of Canterbury or to that of York, to consult on ecclesiastical matters. From the fact that the province of Canterbury is by much the more influential of the two provinces into which England is ecclesiastically divided, the convocation of the province of Canterbury is often spoken of as *the* convocation, as if there were only one, although there are strictly speaking two, as above stated. In the province of Canterbury the convocation consists of two houses, an upper and a lower. In the former sit the bishops, and in the latter the deans and archdeacons, along with the proctors, who represent the inferior clergy and the chapters of cathedral-churches. In the convocation of the province of York (which meets very rarely), the usual practice has always been for all the members to sit in one house. Originally convocations were merely ecclesiastical councils that had no special privileges or recognized political status, but gradually they came to assume their present form, being endowed with the right of passing canons, of determining their own taxation, &c. When thus formed into an assembly, having certain political as well as ecclesiastical functions, there was only one convocation for all England, and this lasted down to the beginning of the fourteenth century, when the clergy of the two provinces began to meet in separate convocations. The archbishop of each province has the right of summoning convocation, but he cannot do so without the royal consent, nor can the convocation pass any canons without the same authority; and from its judicial proceedings there lies an appeal to the queen in council. In 1664 the practice of granting subsidies to the crown in the exercise of the right of self-taxation enjoyed by the clergy was discontinued, and since that time their functions have been mostly formal. In the reigns of William III. and Queen Anne the convocation of the province of Canterbury recovered some degree of importance, but in 1717 that temporary influence was again lost, and from that year down to a recent period the practice has been to prorogue the convocation as soon as it assembled. Recently, however, the Canterbury convocation has begun to sit for a short time at the opening of every session of Parliament for the transaction of business, and in one instance in 1861 it exercised its legislative power, the first time for a long series of years.

CONVOLVULACEÆ, or BINDWEEDS, an order of herbaceous or shrubby plants, usually twining and milky, with plaited corolla, imbricated calyx, alternate, undivided, or lobed and pinnatifid leaves; bell-shaped flowers, axillary or terminal; five free stamens, and fruit with two or three cells. Many of the order contain a milky and resinous juice, possessing purgative properties more or less drastic. Jalap is derived from the *Exogonium* (*Ipomœa*) *purga*, an inhabitant of Mexico and the southern parts of the United States; and scammony, a resinous substance, possessed nearly of the same properties as jalap, is the inspissated juice of the root of *Convolvulus scammonia*, a native of Syria. Some species of the order have tuberous and fleshy roots, containing a farinaceous and saccharine principle, which fits them for being the food of man and beast. Among these is *Convolvulus batatas*, the sweet-potato, originally from India or South America, but now cultivated in all countries where it can stand the climate. *Convolvulus dissectus*, one of the plants from which the liqueur *noyau* is prepared, abounds in prussic acid. The species of *Rhodorhiza* yield by distillation an essential oil called oil of rhodium, which has a bitter balsamic flavour. Their wood when powdered forms an agreeable snuff, and when burned is very fragrant.

CONVOLVULIN. The purgative constituent of jalap is obtained from the root by treatment with water, and then with strong alcohol. The alcoholic extract is mixed with water, boiled with animal charcoal, filtered, evaporated, and treated with ether so long as anything dissolves. Pure convolvulin is transparent and colourless, brittle at 212°, fuses at a higher temperature to a clear liquid, and is decomposed by strong heating. It is insoluble in water and ether, soluble in alcohol. It has no taste or smell. In doses of 2 or 3 grains it is a powerful purgative, and in larger quantity is fatal to animals. By treatment with alkalies it is converted into *convolvulic* acid, and by acids into *convolvulinol* and sugar.

CONVOLVULUS. See CONVOLVULACEÆ.

CONVOY (from the French *convoyer*, to accompany), in naval language, signifies a fleet of merchantmen, bound on a voyage to some particular port or general rendezvous, under the protection of a ship or ships of war. It also means the ship or ships appointed to conduct and defend them on their passage thither. In military language it is used for *escort*.

Convoy, or *brake*, is a crooked lever, applied to the surface of the wheels of carriages, so as to retard their motion by its friction.

CONVULSION (Latin, *convulsio*, from *convello*, to pull together), a diseased action of muscular fibres, known by violent and involuntary contractions of the muscular parts, with alternative relaxations. Convulsions are universal or partial, and have obtained different names according to the parts affected, or the symptoms: as the *risus sardonicus*, when the muscles of the face are affected; *St. Vitus's dance*, when the muscles of the arm are thrown into involuntary motions, with lameness and rotations. The hysterical epilepsy, or other epilepsies, arising from different causes, are convulsive diseases of the universal kind. The muscles of the globe of the eye, throwing the eye into involuntary distortions, in defiance of the direction of the will, are instances of partial convulsion. The muscles principally affected in all species of convulsions are those immediately under the direction of the will, as those of the eyelids, eye, face, jaws, neck, superior and inferior extremities. The muscles of respiration, acting both voluntarily and involuntarily, are not unfrequently convulsed, as the diaphragm, intercostals, &c. The more immediate causes of convulsions are mental affections, or any irritating cause exciting a great action in the arterial system of the brain and nerves. After muscles have been once accustomed to act involuntarily, and with increased action, the same causes can readily produce the same effects on those organs. All parts that have muscular fibres may be convulsed. The sensations in the mind most capable of producing convulsions are timidity, horror, anger, great sensibility of the soul, &c. Children of a nervous temperament are often the subjects of convulsions during dentition, particularly when accompanied by a disordered state of the bowels or the presence of worms; and often these two latter conditions are the sole cause of convulsions in young persons.

CONVULSIONISTS. See JANSENISTS.

CONWAY, a river rising from two head-streams, one in the south-east of the county of Carnarvon, and the other in the south-west of the county of Denbigh, which unite about 15 miles south of Conway. The united stream flows north, separates Carnarvon from Denbighshire, and falls into Beaumaris Bay, after a course of from 25 to 30 miles. It is navigable to Llanrwst, or about 10 miles from its mouth.

CONWAY, CONWY, or ABERCONWY, a town and parliamentary borough, North Wales, county of Carnarvon, about 13 miles E.N.E. of Bangor. It is picturesquely situated on the left bank of the Conway, and surrounded with an old wall still in good preservation, 12 feet thick, and fortified with towers and battlements. The old castle of Conway, erected towards the end of the thirteenth century by Edward I., is one of the most magnificent structures of the kind in England. Many parts of it are still entire, including the state-hall, which is 130 feet long, 32 broad, and 20 high. There is little trade here, and no manufactures. A few small vessels belong to the port, from which some timber, slates, and lead are exported. A stupendous suspension-bridge over the river, finished in 1826, superseded a dangerous ferry at the same spot. In 1848 another bridge was thrown across the river by R. Stephenson for the accommodation of the Chester and Holyhead Railway. It is a wrought-iron tubular bridge, on the same principle as the Britannia Bridge over the Menai Strait. The length of the tube is 400 feet, and it is 18 feet above high water mark. Pop. in 1871, 2620.

COOCH-BEHAR, a principality, Hindustan, to the north of the province of Bengal; area, 1364 square miles. The south parts of this principality are fertile and well cultivated; but those in the north are low, marshy, and covered with jungle. The chief objects of culture are opium, cotton, indigo, wheat, and a little barley. It is subject to a native prince who bears the title of rajah, but it is tributary to Britain, being one of the protected states. Pop. 136,000.

COOK, JAMES, a British seaman, highly celebrated for his maritime discoveries. He was born at Marton, a village in the North Riding of Yorkshire, Oct. 27, 1728, of sober and industrious parents, not above the rank of peasantry. After having learned reading, writing, and a little arithmetic at a country school, he was put apprentice to a shopkeeper at Snaith, a small town on the sea-coast. Here he acquired such a taste for the occupation of a sailor, and so much consequent dislike of his business, that his master gave up his indentures, and he soon after bound himself to two brothers, ship-owners of Whitby, for three years, and continued in their employ for some time after. At the commencement of the French War in 1755 he entered the royal navy. In 1759 he was made master of the *Mercury*, which belonged to the squadron sent against Quebec, and performed the hazardous service of taking soundings in the river St. Lawrence, opposite the French encampment. He also made a chart of the river St. Lawrence below Quebec in a very satisfactory manner. At the end of 1762 he returned to Britain; but the next year he accompanied Captain Graves to Newfoundland as a marine surveyor. After again visiting Britain he went out in the same capacity with Sir Hugh Palliser, appointed governor of Labrador and Newfoundland. In this situation he made himself known to the Royal Society by the communication of an observation on a solar eclipse in 1766, with the longitude of the place deduced from it.

In 1768 he was appointed to the command of the *Endeavour*, a vessel destined to convey to the Pacific Ocean persons employed by government to make observations on the transit of Venus. He sailed from Deptford, June 30, 1768, with the rank of lieutenant in the navy. He was accompanied by Mr. (afterwards Sir Joseph) Banks, and the Swedish naturalist Dr. Daniel Solander. The transit of Venus, June 3, 1769, was advantageously observed at Otaheite; the neighbouring islands were explored, and Lieutenant Cook then sailed for New Zealand, where he arrived in October. Six months were employed in examining the shores of the islands; after which he took his departure for Australia, the eastern coast of which he attentively surveyed. On his return Cook was raised to the rank of master and commander in the navy. An account of the voyage, drawn up by Dr. Hawkesworth, was speedily published, and a second expedition was planned to explore the Antarctic regions, for the purpose of ascertaining the existence or non-existence of a circumpolar southern continent.

On this occasion two ships were employed—the *Resolution*, of which Captain Cook had the command, and the *Adventure*, under Captain Furneaux. Dr. John Reinhold Forster and his son went out as naturalists, Mr. Hodges as painter, and Messrs. Wales and Bayley as astronomers. The voyage was commenced July 13, 1772; and after proceeding as far south as the latitude of 71°, where a barrier of ice opposed any further progress, discovering the island of New Georgia in 54° S. latitude, and visiting Otaheite and other places, Captain Cook returned to Britain in 1775. So successful were the means employed by Captain Cook for the prevention of disease among his crew, that only one man was lost by sickness during the expedition. The captain having communicated to the Royal Society a paper describing the regulations and remedies which he had adopted, he was chosen a fellow of that body, and his experiments were rewarded by the Copleian gold medal. Government rewarded him with the rank of post-captain in the navy, and the appointment of captain in Greenwich Hospital. The narrative of this voyage was drawn up by Captain Cook himself, and was published at London in 1777.

In July, 1776, he sailed on an expedition to ascertain whether any communication existed between the Atlantic and Pacific Oceans in the Arctic regions. In this voyage he again commanded the *Resolution*, which was accompanied by the *Discovery*, and explored a considerable extent of the western coast of North America. He also discovered the Sandwich Islands, and to Owhyhee (now called Hawaii), one of this group, he returned from his American survey to pass the winter of 1778. In February Captain Cook sailed for Kamtschatka, but was compelled by an accident to put back to Owhyhee. A boat having been stolen by one of the islanders, the captain went on shore to seize the King of Owhyhee, and keep him as a hostage till the boat was restored. The people, however, were not disposed to submit to this insult; their resistance brought on hostilities, and in attempting to reach his boat Captain Cook and some of his attendants became victims to the fury of the irritated islanders. The death of this great seaman took place February 14, 1779. A complete account of this third voyage appeared in three volumes at London in 1784. The first two volumes were by Captain Cook himself, and the third by Captain James King. A medal in commemoration of him was struck by order of the Royal Society; his eulogy was pronounced in the Florentine Academy, and was made a prize subject by one of the French scientific societies; and a pension of £200 a year was bestowed upon his widow by the king, and one of £25 a year on each of his children.

COOKERY. There is abundant evidence of the early period at which cookery came to be studied as

an art. Brilliant descriptions of the feasts of the ancient Asiatics have come down to us, and though we know little or nothing of their methods of cooking, we can judge from the number of cooks that Xerxes took with him in his train, on the occasion of his invasion of Greece, how much importance the art had in the eyes of that voluptuous monarch, and how much attention it received, in Persia at least. The Greeks, like all primitive peoples, at first contented themselves with viands simply prepared; but having become acquainted through the Persians with the luxuries of the table, it can scarcely be doubted that in a short time they at least equalled their teachers in the practice of this art. The Spartans, however, must be excepted, who despised luxury of all kinds, and in the matter of cookery remained long faithful to their 'black soup,' a dish that to any other than a Spartan was scarcely palatable. Among the other Greeks the functions of a cook were regarded as of great importance. They were confided, not to slaves, as among the Romans, but to free men, who were genuine artists, and who used to stand in public places waiting till they were hired by some rich person, who wished to engage their services. The early Romans did not disdain to direct their attention to cookery. Cato, in his book on agriculture, gives several receipts for dishes of flour and vegetables. The introduction or successful cultivation of important vegetables was frequently the occasion of surnames in the early times of Rome, as *Lentulus*, *Fabius*, *Cicero*. The meals of the Romans consisted generally of three courses: the first contained light food, eggs, oysters, and the like, to excite the appetite; next came the *brunt of war*, as the ancients called it, made up of roast and boiled dishes of every description; then followed the dessert (*mensæ secundæ*) of fruit and pastry. Luxury in eating increased when the Romans became acquainted with Asiatic magnificence, to such a degree that laws were required to keep it within bounds. Lucullus carried epicurism to the extreme. He erected several dining-halls in his palaces, and gave to each of them the name of some deity, which was a guide to the steward in regulating the etiquette and the expenses of the banquet. Under Pompey M. Aufridius Lurco invented the fattening of peacocks, and in this way earned, in a short time, 60,000 sestertia (£530,000). During this period an actor had a dish prepared which cost £422. It consisted of singing and talking birds, each of which was valued at £25. The son of the same actor entertained his friends with pearls, which he dissolved in vinegar. Under Tiberius there were schools and teachers of cookery in Rome. One of the family of the Apicii invented many new dishes; for example, a salt dish of fishes' livers; also many cooking utensils, and the art of fattening swine on dried figs. Another wrote a book on cookery, and invented the art of keeping oysters fresh. The Emperor Vitellius was once entertained by his brother with 2000 choice fishes and 7000 birds. Vitellius himself once had a single dish prepared of the livers, the young, and the brain of many select birds and fishes. Roman cookery was remarkable for the almost universal use of oil or oily substances. In the later ages of Roman greatness, the object of the cook was to please the palate rather than to provide for the healthful nourishment of the system. In the middle ages the Italians, who outstripped the rest of the nations of Europe in every branch of civilization, attained also much earlier a degree of accomplishment in the culinary art. They carried it to much perfection as early as in the sixteenth century, and probably earlier, as some passages of their *novelle* lead us to suppose. The artists of that country delighted much in convivial assemblies, and the chief cook of St. Pius V., Bartolommeo Scappi, published in 1570 an excellent work on the art of cookery (Opera di Bartol. Scappi, cuoco secreto di Papa Pio V. divisa, etc. con il Discorso Funerale, che fu fatto nelle esequie di Papa Paolo III., 4to). The princesses of the house of Medici appear to have transplanted the Italian cookery to France, at least to the French court. The Italian cookery was, however, very similar to that of the ancient Romans, as even the mode of preparing dishes at present prevalent in Italy has still retained much of the ancient character. We refer particularly to the abundant use of oil. In fact, this character prevails more or less in the cookery of all nations of Latin descent. However great the influence may have been which Italian cookery exercised on the French system, it is to the inhabitants of France that we owe the usage of seasoning meat mostly with its own gravy, whereby a much greater variety is obtained, and the dishes are, at the same time, more wholesome than those prepared in the old modes. From the accounts of the household of Louis XV., it appears that the court dined with moderation. From eight to nine dishes only were served; but two-thirds of the meat used in the kitchen was taken for gravy. Of course this was possible only in a royal kitchen; but the tendency of the modern culinary art appears clearly enough from this instance. When the French revolution brought the 'third estate' into honour, the old national French soup, *pot au feu*, came into notice—a dish on which the French pride themselves justly. The new mode of cooking became now more and more popular. But soon after the great excitement of the revolution had subsided, and men had leisure to think of their palates, an over-refined style of cookery was introduced, and gave rise to works like the Almanach des Gourmands. The dishes of this latter period are not to be rashly ventured on, but to be eaten with a wise circumspection. The British took quite a different turn from that of the Italians and French. Owing to their situation on an island, which prevented them from constant association with other nations, at least as far as respected the people at large, and probably owing, in part, to their national disposition, their cookery has been mostly confined to simple, strong, and substantial dishes. The art of roasting has been carried by them to great perfection. With other British customs, the British cookery likewise came to the United States; but that country, which has departed from the British standard in regard to many things of more importance, has not confined itself to a servile imitation of British cookery, but has borrowed much from the European continent. Soup has become general; and, in preparing vegetables, the French way has been followed more than the British. But the system of cooking in the United States has many defects. Many dishes are spoiled by butter and fat, and, on the whole, far too much meat is eaten—a very natural consequence of which is the everlasting complaint of dyspepsy. A country so rich in fruits ought to allow them a large place in its cookery. If the culinary art were properly investigated, many facts would be brought to light which have as yet been little attended to. Thus, for instance, it would be very interesting, in a medical point of view, to show the intimate connection of different diseases, in various countries, with the common dishes. Of late, attempts have been made in London and other places to diffuse a knowledge of cookery more widely among the lower classes, so as to enable them to prepare their dishes with the greatest attainable amount of economy, and at the same time to increase with simple means the variety and relish of their food. Among works on the subject of cookery may be mentioned the Cook's Oracle and Housekeeper's Manual, by Dr. Kitchener; the Cook

and Housewife's Manual, by Mrs. Margaret Dodds, of the Cleikum Inn (Mrs. Johnstone, of Edinburgh); the Art de la Cuisine Française au XIX. Siècle, by Carême (the most famous of recent French cooks); the Pâtissier Pittoresque, and Cuisinier Parisien by the same; &c. &c.

COOK'S ISLANDS, a group in the South Pacific Ocean, between the Friendly and Society Archipelagos, consisting of nine or ten islands; includes Raratonga, one of the principal stations of the London Missionary Society, Mangaia, Aitulaki, Atue, Mitiero, Mauki. The islands are much frequented by whale ships for fresh provisions. They receive their name from their great discoverer.

COOK'S LAND. See QUEENSLAND.

COOK'S STRAIT, the channel which separates the two principal islands of New Zealand, discovered by Captain Cook in 1770.

COOKSTOWN, a town, Ireland, county Tyrone, on the Ballinderry, 10 miles north of Dungannon. It has a handsome parish church, besides other places of worship; a news-room, a dispensary, and several schools. Linens are manufactured to a small extent. Pop. in 1871, 3653.

COOLIE, originally corrupted from *Kola* or *Koli*, the name of a native tribe of Hindustan, afterwards applied to the porters or native labourers about Bombay, from the fact that these frequently belonged to the tribe mentioned, and still later extended to Indian labourers generally, and even to those of other eastern countries, such as Anam, China, and Japan. In recent times it has come to be specially applied to Indian and Chinese labourers, who take the place of negro slaves since the abolition of slavery in different parts of the world, or since a stop was put to the practice of carrying off negroes from the African coast. Free negroes are generally found to be so indolent that they are insufficient to perform the work that was formerly done by slave labour, and even if they worked when free as hard as they were compelled to do as slaves, their number would still have to be recruited from other sources, since fresh supplies are no longer to be got from Africa. To supply this want of labour, which might have been the ruin of the colonies and countries that had been dependent on slave labour, Chinese and Indians were induced, sometimes by the offer of advantageous terms, sometimes by fraudulent representations, to emigrate to those parts where the want was felt. The first coolie emigrants appear to have been those who were brought from Calcutta to British Guiana in 1839, soon after the complete abolition of slavery in that colony. This first attempt to use Indian labour in the American plantations was not very successful, as the immigrants were attacked by the chigre or jigger, a very noxious insect which infests the toes of human beings in Guiana, and which ultimately compelled the removal of the imported coolies to the hospital of the colony. For a time the coolie emigration was put a stop to by the Indian government, but it was afterwards allowed to go on again, better regulations being made to enable the coolies to understand exactly the terms on which they left their own country, as well as to secure their health on their arrival in the colony. Emigration agents were appointed in India to supply information to those who thought of emigrating; and other agents were appointed in the colony to protect their interests there. The coolies after reaching Guiana are under the protection of the governor of the colony, who distributes them among the planters who require their labour. The planter is obliged to pay an indenture fee of 50 dollars (£10) towards the cost of introducing the immigrants. The coolies must enter into a contract to serve in the colony to which they are taken for five years (during the first three of which they are bound to one master), and after ten years they are entitled to a free passage back to their native country. This applies, however, only to Indian and not to Chinese coolies, who are not entitled to a back passage. To induce the acclimated and skilled labourers to continue on the estates, the planters frequently pay a bounty to those whose term of service is out, it being obviously more advantageous for them thus to pay a bounty for skilled labour to the labourers themselves than to pay one to the government for unskilled labour. As this re-engagement is entirely voluntary, the number of those who choose to take the bounty and remain affords a good indication of how far the coolies are satisfied with their engagements. Every estate having indentured immigrants is visited twice a year by the sub-immigration agents, and twice by the inspector-general of estates hospitals, who reports on the hospitals and dwellings of the immigrants. The coolies employed in Guiana are chiefly Indians, but there is also a considerable number of Chinese. Coolies have also been introduced into Jamaica, the Mauritius, and various other British colonies. In the first-mentioned island coolie immigration entirely ceased between the years 1863 and 1867, but in 1867 it revived, and has since been increasing. In the year 1868, however, owing to some mismanagement in India, no coolies were received, and the disappointment which the planters felt at this led to the appointment of an agent in India specially for Jamaica. The regulations with regard to the time of service and the time after which the coolies are entitled to a free passage home are the same as those in Guiana. In 1869 a law was passed by the Jamaica legislature requiring every planter employing indentured Indian immigrants to supply them with daily rations during the whole of his indentured service (five years), according to a scale and price to be fixed by the governor in privy-council. The effects of this regulation are already seen in the increased health and strength of the coolies. In the Mauritius, as in British Guiana and Jamaica, it was formerly the practice to grant free return passages to the coolies, but this practice fell into abeyance. The question of reviving the practice was recently debated in the legislative council of the island, and on the 21st of May, 1872, a resolution in favour of the revival was passed by the council of government. If this resolution is acted on, it is expected that it will help the agents of the Mauritius in India to overcome the difficulty that they frequently meet with in procuring a sufficient number of coolie emigrants. The Chinese coolie emigration has not been conducted in so satisfactory manner as the Indian. One of the chief places at which Chinese coolies are shipped for foreign countries is Macao, and until 1868 the Portuguese authorities used to wink at the most shameful proceedings on the part of those who carried on this trade. Kidnapping was practised with impunity, and the whole system resembled in every respect the slave traffic on the coast of Africa. In the year mentioned the British governor of Hong-kong intervened, and the Portuguese authorities are now watched by secret agents of the British. In the other Chinese ports the shipment of coolies is watched over by the British consuls. These Chinese coolies were principally sent to Peru, the Chincha Islands, and Cuba, and on their arrival, instead of being engaged as labourers at a paid wage on the plantations, they were generally sold to the highest bidder. In 1856 a decree was issued by the Peruvian government prohibiting the introduction of Chinese labourers in the violent and cruel manner that had hitherto been prevalent, but it still continued to be practised in Cuba. In Brazil, where considerable numbers of coolies have been employed since 1852, they do not

appear to have been treated with the same cruelty. These Chinese coolies are not to be confounded with the Chinese emigrants, who began about the same time as the coolie traffic was commenced to leave their homes in large numbers for Australia and America. The latter pay their own passage, and on reaching their destination are entirely free to engage with whom they like and for as long as they please, while the former have their passage paid for them, and in return (when not sold as slaves) are bound, like the Indian coolie, to work for a certain term of years for the country at whose expense they have been brought out.

COOLING, VELOCITY OF. A body isolated in air or other gas, or in *vacuo*, and surrounded by bodies colder than itself, loses heat, by radiation in the last-mentioned case, and in the former case partly by radiation and partly by convection. The rate at which its temperature decreases depends on a variety of circumstances:—on the nature of its surface, for example. (See HEAT, RADIANT.) But, other things remaining the same, the velocity of cooling is proportional to the excess of the temperature of the body in question above that of its surroundings. This is Newton's Law of Cooling.

The law of cooling has been verified by Dulong and Petit experimentally in the following way:—A copper ball was suspended in the midst of a metallic chamber, round the outside of which water was kept flowing, in order to maintain a constant temperature. The copper ball was heated before being suspended in the chamber, and a thermometer was inserted in a hole in the ball, and so arranged that the stem, which was long, projected to the outside of the chamber and could be read there. The fall of the temperature of the ball during equal intervals of time was noted, and it was found to become less and less as the temperature of the ball gradually approached that of the walls of the surrounding chamber, the law of decrease being that stated above.

The following example will illustrate practically the meaning of this law. Suppose the temperature of the ball to be 20° higher than that of the inclosure at the beginning of the experiment, and that during the first five minutes it loses 1°, that is $\frac{1}{20}$ or 5 per cent. of the excess of temperature. During the next five minutes it will lose 5 per cent. of the excess that remains, that is of 19°. It will therefore lose 0°·95, or the temperature of the ball will be 18°·05 above that of the inclosure. At the end of the next five minutes the difference of temperatures of the ball and inclosure will be 17°·15, and so on.

COOMASSIE, a town, West Africa, capital of Ashantee, 130 miles north of Cape Coast Castle, with a population which the Ashantees estimate at upwards of 100,000. It occupies an oblong space, nearly 4 miles in circuit, on the side of a rugged hill, and has four principal streets, each about half a mile long, and from 50 to 100 yards wide. The houses, formed of stakes and wattle-work, filled up with clay and thatched with palm-leaves, are often furnished with arcades, and ornamented with painting and carved work. Many of the windows, formed of open wood-work, are fancifully carved, and cased in gold as thick as cartridge-paper.

COOMBE, WILLIAM, born at Bristol in 1741, died in 1823, author of several popular works, including the Diaboliad; the Devil upon Two Sticks in England, a continuation and imitation of Le Sage's novel, but far inferior in spirit and graphic delineation to the original; the Tour of Dr. Syntax in Search of the Picturesque, &c. The last-mentioned poem was originally written for Mr. Ackermann, and published by him in the Poetical Magazine with Rowlandson's illustrations. Mr. Ackermann, in 1812, published a History of Wesminster Abbey, in two vols. 4to, from the pen of this gentleman, who also was a principal contributor of essays, short pieces illustrative of engravings, &c., to many of his miscellanies. Mr. Coombe's last poem was the History of Johnny Quæ Genus, which, like his Syntax, English Dance of Death, and Dance of Life, was accompanied by Rowlandson's prints. In his youth Mr. Coombe inherited a moderate fortune, which he soon dissipated; and during the last years of his long life literature was his principal support.

COOMPTAH, a town, India, presidency Madras, district North Canara, 100 miles N.N.W. Mangalore. It stands about a mile east of a creek on the coast which forms its harbour, and was a place of consequence till it was pillaged and burned by the troops of Hyder Ali. After a long period of decline it has begun to revive, chiefly in consequence of the rapid extension of cotton cultivation in the district. Pop. 7000.

COOPER, SIR ASTLEY PASTON, the most famous surgeon of his day in Britain, was born at Brooke, in Norfolk, August 23, 1768, and was the fourth son of Dr. Cooper, the curate of the place. He came to London at the age of sixteen to attend the hospitals, with a view to becoming a physician. He soon showed an ardent attachment to his profession, his studies being much benefited by attending the lectures of John Hunter, whom he regarded with great veneration. In 1787 he studied at Edinburgh, but the same year he returned to London, and continued his studies under Mr. Cline, then surgeon of St. Thomas's Hospital. In 1792 he visited Paris, where he attended the lectures of Desault and Chopart. In 1794 he was appointed professor of anatomy at Surgeon's Hall; in 1800 he became head surgeon of Guy's Hospital; in 1813 he was appointed professor of comparative anatomy to the College of Surgeons, and became in 1822 one of its court of examiners. In this year appeared his great work On Dislocations and Fractures of the Bones. Shortly thereafter he was elected president of the Royal College of Surgeons, and doctoral honours from different medical and scientific societies and learned institutions, home and foreign, were worthily conferred upon him. Having performed a slight operation on George IV. he was created a baronet in 1821. His practice, which had been long extensive and lucrative, now largely increased. After a youth and manhood of great health, vigour, and cheerfulness, fits of giddiness came on in his latter years, during the last of which he died, Feb. 12, 1841.

COOPER, JAMES FENIMORE, an eminent American novelist, born at Burlington, New Jersey, in 1789, studied at Yale College, Newhaven, and entered the American navy as a midshipman at the age of sixteen. He remained in the navy during six years, and acquired that knowledge of seafaring matters and sea characters which afterwards constituted one of his peculiar excellencies. In 1811 he married a sister of Bishop de Lancey, of New York, and in 1821 appeared the novel of Precaution, the first production of his pen. It met with considerable success, but though well written, is merely a tale of English domestic life, which gave no scope for his peculiar powers. These, however, were brilliantly displayed in the Spy and the Pioneers, which quickly followed Precaution, and gave him a high place among the first novelists of the age. Encouraged by success he proceeded in his career of fiction, and has given to the world upwards of thirty novels. Among these the Pilot, Red Rover, and Waterwitch are distinguished by admirable delineations of nautical characters; while the prairies and desolate wilds of North America have never been delineated more truly and

powerfully than in his Pathfinder, Deer-slayer, and Last of the Mohicans. His zealous attachment to his own country and her institutions are so strongly displayed in most of his works as to make it difficult occasionally for readers of other countries to sympathize with him, and yet it is said that in his later years he was suspected of aristocratic tendencies. Owing to debilitated health he was induced to visit England and France, and acted from 1826 to 1829 as consul for the United States at Lyons. He afterwards visited Germany, travelled through Switzerland and Italy, and returned to America in 1831. For nearly twenty years afterwards he continued his literary labours, and died at Cooperstown, New York, in 1851. He did not confine himself entirely to fiction, but wrote a History of the United States' Navy, two volumes; Gleanings in Europe, six volumes; Sketches of Switzerland, four volumes; and other works.

CO-OPERATIVE SOCIETIES are associations of individuals generally belonging to the labouring classes for mutual assistance in any purpose. The most common forms of co-operative societies are associations of men belonging to any particular trade or industry for the purpose of carrying it on entirely by their own efforts, and thus securing all the profits of their labour to themselves, or, secondly, associations of a more general nature, the object of which is to provide the members, and sometimes also the general public, with the ordinary household necessaries. Societies of the former kind are called *Working Men's Associations*, and those of the latter kind *Co-operative Stores*. The constitution of all these societies is regulated by the Friendly Societies' Act of 1855 (18 and 19 Vict. cap. lxiii.) and the Industrial and Provident Societies' Act of 1862 (25 and 26 Vict. cap. lxxxvii.), amended by 30 and 31 Vict. cap. cxvii. Two of the chief provisions of these acts are contained in the clause enacting that no member of any society registered under the act shall hold an interest in that society exceeding £200, and in that providing exemption for these societies from the income-tax. Co-operative stores have been established very widely in England. While agreeing generally in having a considerable number of shareholders, and these only to a small amount, and in the general objects of the societies, they differ in some points in constitution and management. Most of these co-operative stores are ready to supply not only the members but all and sundry with the articles in which they deal; and the profits are divided either among the shareholders exclusively, or among both shareholders and purchasers. In the first case the division is sometimes made on the capital alone, as in joint-stock companies, sometimes partly on the capital, and partly in proportion to the amount of purchases made by the shareholders. In the second case, a fixed percentage is reserved for the shareholders, and the remainder of the profits is divided among all the purchasers, whether shareholders or not, in proportion to the amount of their purchases. As the first kind of stores here mentioned are merely joint-stock companies, it is unnecessary to say more about them. One of the most successful co-operative stores in England, the Rochdale Equitable Pioneers' Society, is conducted on the principle of dividing the surplus profits among the members alone in proportion to their purchases, after a certain fixed per-centage has been deducted for interest on the capital subscribed. The method by which this is managed is this: Every customer, on making a purchase, receives a tin ticket indicating the value of the purchase, and at the end of every quarter, when the profits are declared, the shareholders give in all the tickets they possess, and each of them receives the share of the surplus profits which corresponds to the gross value represented by the tickets he gave in. Although none but members are thus entitled to a return upon their purchases, any one is allowed to buy at the store, and purchasers who are not members may dispose of their tickets to those who are, and these receive the due proportion of surplus profits for them just as if the purchases had been made by themselves. The history of this society is somewhat remarkable. It commenced in 1844 with only twenty-eight members, who began by subscribing very small sums to a common fund, and kept on subscribing until they thought they had enough to start on. By prudent management they attained such a degree of prosperity, that seventeen years after they numbered 4000 members, who represented a capital of nearly £40,000. It provides its customers with butcher meat, all kinds of groceries, boots and shoes, drapery, &c. One peculiar feature of this society is that after the interest on capital is paid, 2½ per cent. of the whole profits is devoted to educational purposes, before the surplus is divided in the manner already stated. With the money derived in this way the society has been able to form a library and provide its members with a reading-room, in which a number of the best newspapers and periodicals may be read. Another flourishing English society, called the Leeds Industrial Co-operative Flour and Provision Society, started in 1847, is conducted upon the principle of dividing the surplus profits among all the purchasers, whether members or not, in proportion to their purchases. The means taken to do this are the same as those used in the Equitable Pioneers' Society at Rochdale. It was originally started with the view of providing good and cheap flour, but soon added the other departments usually found in co-operative stores. The principle of co-operation has, perhaps, been more extensively carried out in Lancashire and Yorkshire than in any other part of Great Britain. In 1871 the capital involved in co-operative societies of all kinds in these two counties alone amounted to £7,000,000. A striking feature in connection with the societies of this part of England is the formation of an association of co-operative societies for the purpose of making their purchases on as large a scale as possible, so as to increase the profits. It is called the North of England Co-operative Wholesale Society, and includes as members upwards of 250 co-operative stores, besides doing business with at least 200 others. Most of these co-operative stores make it a rule never to buy anything on credit for their own use, nor to allow any customers to make purchases except for ready money. In this way no one can ever be a debtor to the society, and none but a member can be a creditor to it. It scarcely requires to be pointed out that the observance of this rule is a great safeguard in the management of their business, and one of the chief causes of the success of such societies. Co-operative stores of a peculiar form have been established in London and some other large cities of the kingdom. These differ from the others chiefly in not being intended for the working-classes, and in confining their transactions exclusively to members. An account of one of this nature at Edinburgh will serve to give a general idea of their working. The society is called the Professional and Civil Service Supply Association, Limited, and its objects are stated to be 'to import or purchase wholesale articles of general consumption and utility, and to retail them to the members for ready money only, at the lowest possible prices, and to make arrangements with manufacturers, traders, and others, to supply at reduced ready money prices to the members, articles not kept in store by the society.' Members pay the sum of £1

to the funds of the society, and receive a ticket of membership, which may be used by themselves or any members of their household, but by no others. Those eligible as members are 'clergymen, lawyers, medical practitioners, officers in the army and navy, members of the civil service, and generally all persons not being retail dealers or workmen.' The profits of the business carried on by the society are applied in reducing the price of articles sold by them, and in increasing the capital; but one of the rules provides that the additions to the capital out of the profits shall not exceed five times the amount of the contributions paid by the members.

Among the other forms of co-operative societies are loan societies, a form which in many instances they have taken on the Continent, though not so often with us, and manufacturing associations of all kinds. The difference between co-operative stores and manufacturing, or, as they are generally called, *Working Men's Associations*, is this, that in the former the shareholders are not the workmen, and the surplus profits, after the deduction of the shareholders' dividend, is divided among the purchasers; while in the latter the shareholders are usually also the workmen, and the surplus profits are divided among them as workmen, after they have received the fixed percentage as shareholders. In some cases it is found necessary to employ a number of workmen who are not also shareholders, and sometimes the shareholders, although working men, do not work in their own establishments, but employ other men like individual capitalists. In such cases the practice varies as to the manner of distributing the profits. Some associations reserve all the profits for their own members, while others distribute the surplus profits among all the workers employed in the establishments, whether members or not. The former is the more usual course, in which case it is evident that such associations do not differ at all from joint-stock companies, the only feature peculiar to them being that they are the result of efforts on the part of working men to better their position. The other course, that of giving a share of the profits to the workers, even though they are not members, has also been tried in some instances, as in the case of the Rochdale Co-operative Manufacturing Company.

In most parts of the continent of Europe the principle of co-operation has been carried out almost as extensively as in England. The first to advocate the principle in Germany was Professor Huber, but the most active and energetic supporter of the movement to carry it out in practice, and the first to start a society of the kind there, was Herr Schulze-Delitzsch. This was a loan institution, which was founded in his native town of Delitzsch in 1849, and although at first a failure, it became, when reorganized on a better principle in 1852, a very successful undertaking. Since that time the number of co-operative societies has greatly increased in Germany. Besides a large number of loan societies, there are societies for the purchase of raw materials, manufacturing associations, societies of united shops (the members of which may expose their own goods for sale in the shops belonging to the society), and co-operative stores. This last kind of co-operative society was not introduced into Germany until several years after the establishment of co-operative loan societies, but since their introduction, they have on the whole flourished, and have multiplied very rapidly. Some of them, however, have been endangered by not adopting the rule of buying and selling only for ready money, which is commonly acted on by co-operative societies. In 1848 a sum of 3,000,000 francs (£120,000) was allotted by the French government to be distributed in loans to manufacturing associations. Fifty-six societies took advantage of this, but the result was in most cases unfortunate. By the year 1864 only four of these societies were still in existence. Many associations, however, which were either for some reason or other refused a share in the loan, or did not desire to participate in it, have had a better fate, and still continue to prosper. Among these are societies of pianoforte-makers, masons, lamp-makers, file-makers, jewellers, chair-turners, &c. In Paris there is a Society of United Shops, but it differs in working from those already mentioned as existing in Germany. By this society a method is adopted which enables the purchaser in the course of time, varying from two to fifty-nine years, to get back all his purchase-money, while the seller still makes a profit, a stated portion of this money being set apart to be invested in government bonds, and restored to the purchaser when it has, with the accumulated interest, reached the amount he originally paid for his purchase. It is unnecessary to go into details with reference to such associations elsewhere. It may, however, be remarked that there are similar ones in Italy, Denmark, Sweden, and other parts of Europe, in America and the English colonies, and there are co-operative loan societies even in China. On the continent of Europe generally the majority of these societies are either loan societies or manufacturing associations, for co-operative stores do not seem to flourish so well abroad as they do in this country.

CO-ORDINATE GEOMETRY. See GEOMETRY (ANALYTICAL).

COORG, or KOORG, an ancient principality, Hindustan, in the S.W. of Mysore, among the Western Ghauts, formerly independent, but now a British possession, under the immediate rule of the Governor-general of India; greatest length, about 60 miles; mean breadth, about 30 miles; area, 1214 square miles. The country in general is extremely rugged, and covered with forests, in some parts abounding in sandal and other valuable woods, but in others overrun with jungle, the resort of elephants and beasts of prey. From the moderate elevation of Coorg, the climate is temperate and healthy; the soil also is fertile, and in many parts well cultivated, yielding in abundance rice of superior quality. Great numbers of cattle are reared. The culture of coffee, pepper, cardamoms, and other spices is much attended to. The manufactures are confined to the apparel of the natives; all their cotton cloths are imported. Periapatam was formerly the capital of the principality, but its present capital is Merkara. In 1834 it was occupied by the British, and in 1835 it was incorporated with the territory of the East India Company. Pop. about 112,000.

COOSY, a river of India, which rises among the snowy peaks of Mount Gonsainthan, near the north frontiers of Nepaul, flows first S.S.E. to the British frontier, and then nearly due south across the alluvial district of Purnea to its junction with the Ganges. In descending from the mountains it forms three cataracts, or rather violent rapids. In Bengal it throws off numerous branches, but still continues a large stream, with a channel from 1½ to 2½ miles wide. Its total length is about 325 miles.

COOT (*Fulica*, Brisson), a genus of birds belonging to the natural order Grallatores or Waders, and the family *Macrodactyli*, or long-toed birds, forming part of the great genus *Fulica* of Linnæus, the rest being included in the genera *Porphyrio* and *Gallinula* of Brisson. These birds have a short conical bill, with a frontal plate of considerable size in the form of a shield, and the toes fringed with a scolloped membrane, which enables them to swim very well. Their plumage is glossy, which with their other characters adapts them very well for living, as they do almost constant-

ly, on pools and marshes. They form the connecting link between the wading and the web-footed birds. The female is distinguished from the male only by having a smaller frontal plate. The young frequently become the prey of buzzards. Species of coots varying in size and colour are found distributed over all countries. These birds assemble in winter in large numbers on the banks of lakes and in marshes. As they see very well during the night, it is then that they seek their food, which consists of small fish, aquatic insects, leeches, seeds, &c. They are never seen flying during the day; sometimes in the evening they may be seen flying from one pond to another. The common coot (*Fulica atra*) is of a dark slate colour, but the frontal plate is white, and there is also a narrow strip of white across the wings. It is universal in Europe. It is about 18 inches in length. The female makes her nest on the ground in the midst of reeds, and lays from eight to fifteen eggs of a grayish brown colour, picked out with spots of a darker brown. The young when hatched are covered with a thick down, and they take to the water very soon. Their frontal plate is not developed till after the autumnal moult. There is a white variety to which Spix has given the name of *Fulica leucorix*. The crested coot (*Fulica cristata*) is found in China and Madagascar. The *Fulica cærulea* (Vandelli) is of a bluish-black colour, with a square red-coloured frontal plate, and a white crest. It is a native of Portugal.

COPAIFERA, a tree of the order Leguminosæ, sub-order Cæsalpineæ. Various species yield the West Indian and Brazilian balsam of copaiba, which consists of a resin and oil, and is used in inflammation of the mucous membranes. It is mostly of a light yellow colour, clear and transparent, has a volatile odour, and a taste at first oily and mild, but at last acrid. It is frequently adulterated, and occasionally mixed with castor, almond, poppy, and nut oil, and the finer kinds of turpentine. When genuine it is perfectly dissolved by alcohol of the strength of 90.

Copaiba balsam consists of several resins dissolved in a volatile oil, but the proportion of each varies in balsams from different localities. The oil is separated by repeated distillation with water, drying, and rectification. It is transparent, colourless or with a yellowish-green tint, has an aromatic odour and bitter taste. It is lighter than water; it solidifies at —14° Fahr., and boils at from 473° to 500° Fahr. It dissolves in alcohol and ether, especially if they be free from water. The chief resin, called copaivic acid, forms colourless rhombic crystals, soluble in ether, in oils, and in alcohol. It combines with the alkalies, with calcium, and other metals, forming copaivates. Copaiba balsam is used in medicine, especially in affections of the mucous membranes. It is given as an emulsion with some aromatic mixture, or inclosed in little gelatine bags. Its use requires care.

COPAIS, a basin and lake in Bœotia, inclosed by mountains on every side, through which flows the Cephissus. The only outlet for this river is afforded by a number of subterranean channels called *Katavothra* at the eastern end of the basin, and as these are not always sufficient to carry off all the water of the river a shallow marshy lake is formed which varies in size according to the season of the year and the volume of water in the river. In summer it almost entirely disappears, and even in winter it is little more than a marsh overgrown with reeds. The ancient Greeks used to catch large quantities of fish in it, and water-fowl frequently abounded on its banks.

COPAL is a gum-resin yielded by different trees in Africa, South America, India, and Australia. Brazilian copal is the produce of leguminous plants, and is in large angular pieces. African copal is in large fragments of rounded tears or masses, is darker in colour than the Brazil kind, less transparent also, and often having a reddish yellow colour. East India copal is known as *gum anime*, and occurs in large pieces, often nearly square, but more frequently in irregular masses, having a degree of transparency, and of a bright amber colour. Australian copal, kauri gum, or Australian dammar, is the produce of the kauri pine (*Dammara Australis*), a native of New Zealand. It is brought to this country in great quantities, and in larger pieces than the other kinds named. All the varieties of copal are used in making varnish, for which purpose they are dissolved in alcohol or turpentine.

The substance called *fossil copal* or *copalin* was found in small lumps in the blue clay at Highgate in 1813. It has a resinous lustre, light-brown colour, and resinous odour; it is readily fusible; it is partially soluble in ether, and is insoluble in water, alkalies, and alcohol. Other fossil resins have been described.

CO-PARTNERSHIP. See PARTNERSHIP.

COPE, a sacerdotal vestment reaching from the shoulders to the feet, worn upon occasions of solemnity. It is fastened by a clasp called a morse across the breast, and is often adorned with rich embroidery and other ornaments.

COPE, SIR JOHN, an English general whose name has become known chiefly through a Jacobite ballad celebrating the battle of Prestonpans, in which he was ignominiously defeated by Prince Charles Edward, on the morning of the 21st of Sept. 1745.

COPECK (*kopeika*, a lance), a Russian copper coin, so called from the impression of St. George bearing a lance. It is the hundredth part of a silver ruble, or about the eightieth part of a paper ruble. It is equal to about three-eighths of an English penny.

COPENHAGEN (in Danish *Kjöbenhavn*), the capital of the Kingdom of Denmark, and the residence of the king; 55° 40′ 9″ N. lat.; 12° 3′ 7″ E. lon.; on the island of Zealand, in the Sound, and on a narrow branch of the sea, which separates it from the island of Amager. Copenhagen is fortified, contains a citadel called *Frederikshavn*, and is well built, with regular well-lighted streets, and fine houses, principally of brick. The natural division of the town is into two parts, separated by the channel between the two islands, and connected by draw-bridges; but another division, once recognized, and still useful for purposes of description, though it has almost ceased to be correct, is into the old town and the new town (both on the Island of Zealand, and together composing Copenhagen Proper), and Christianshavn, on the Island of Amager. The boundary between the old and the new town is a principal street, called Gothersgade (Goth's Street), which, with its continuation along the canal of Nyehavn (New Haven), stretches through Copenhagen Proper from north to south, and cutting it centrically, divides it into two nearly equal parts. The west part or old town, where it has not been replaced by modern buildings, exhibits the Copenhagen of the olden time, and consists generally of narrow crooked streets, lined by mean, and in many cases wooden houses. Many of the finest public buildings, however, belong to this division, particularly that part of it called Slotsholm (castle island), a kind of island formed by the channel already mentioned, and canals branching from it, and which, though the original nucleus of the city, has become one of its newest sections. The east part or new town, and also Christianshavn, are almost entirely of modern construction, the former being built according to a plan, which, if completed, would give Copenhagen a first place among European cities.

The channel separating Christianshavn from Copenhagen proper forms a safe harbour, capable of admitting 400 vessels, where the naval arsenal, the dock, and other buildings requisite for the navy are situated. This is likewise the station of the fleet. Outside of the fortifications are three suburbs, partly composed of fine country-seats.

In the year 1794 Christiansborg, the most splendid of the royal palaces of the city of Copenhagen, was burned down. The new palace which has been erected on its site is on the whole a very indifferent substitute for it, although it has a fine portal, adorned with statues and reliefs by Thorwaldsen. The other principal palaces are Charlottenborg, now the repository of the Academy of Arts, and furnished with a gallery of paintings; the old royal palace Rosenborg, where many antiques and precious articles are kept, adjoining to which is the king's garden, a public promenade; and the Amalienborg, consisting, properly speaking, of four palaces, which were purchased for the residence of the king after the fire had consumed the palace.

Among the other buildings worthy of being mentioned are, the arsenal, in which is the royal library, containing 500,000 volumes and 20,000 manuscripts, among them Rask's celebrated Sanskrit and Singhalese collection, Thorwaldsen's Museum, partly Egyptian, partly Grecian, containing the rich bequest of that great sculptor; the theatres; the exchange, with the bank; the Trinity Church and the beautiful Frederick's Church; the large, beautiful, and admirably arranged Frederick's Hospital; the foundling, lying-in, and marine hospitals. Among the buildings which have been recently added are the Zoological Museum of the university, the National Bank, and the industrial exhibition, in which the Northern Exhibition of Arts and Manufactures was held in the summer of 1872. The Kongens Nytorv (New King's Market) contains a statue of Christian V., and Frederick's Place contains a fine equestrian statue of Frederick V. Among the scientific establishments are the university, founded by Christian I. in 1478, with four faculties, a library of 200,000 volumes, with valuable northern and oriental manuscripts; a botanical garden and an observatory; the Royal Surgical Academy, which has about 200 students; the academy for military cadets and midshipmen; the royal and university library; the public library of Classen, founded in 1776, by two brothers named Classen; several public and private museums; the Royal Academy of Sciences and Arts; the society for the study of the Northern languages and history; the Iceland and Scandinavian societies; the Surgical Academy; 114 schools, among which is one for the deaf and dumb, and one for the blind; the veterinary school and gymnastic establishment, &c. Many of the admired works of Thorwaldsen adorn the churches and palaces of Copenhagen; and a special gallery of his sculpture called the Thorwaldsen Museum was opened in 1846.

Copenhagen is the centre of the domestic and foreign commerce of Denmark, which is promoted by the West India and other companies, and by the beautiful harbour. At the beginning of 1872 the town possessed 382 merchant ships (forty-eight of which were steamers) of 49,771 tons burden. The manufactures of Copenhagen are not very important, and are almost entirely confined to the supply of articles for home consumption, or for the army and navy. The chief of these are woollen cloth, for which, in addition to private establishments, there is a government factory employing 1200 persons, and annually furnishing about 150,000 ells; linen and sailcloth, tobacco, ironware, and porcelain. Sugar-refining and tanning have also developed considerably.

Copenhagen is first mentioned as a fishing hamlet in 1043. In 1168 Bishop Axel or Absalom founded a haven, and erected a fort on the Slotsholm, as a place of refuge against the northern pirates. It then bore the name of Axelhuis. Shortly after it rose to importance, and acquired its present name of Kjöbenhavn, or Merchant's Haven. In 1443 it was made the capital of Denmark. It has occasionally suffered much from hostile ravages, and still more from accidental fires, which have repeatedly laid the greater part of it in ruins. One of the most disastrous of these was the fire of 1728. In 1801 the Danish fleet was defeated by Nelson here, and its crowning disaster was the bombardment by the British from the 2d to the 5th of Sept. 1807. The environs of Copenhagen are some of them very fine. In the neighbourhood are the royal summer palaces Fredensborg, Frederiksborg, Jägerpriis, and Bernstorff. Pop. of Copenhagen in 1870, 181,291.

COPERNICUS, or KOPPERNIGK, NICHOLAS, born at Thorn, on the Vistula, Feb. 19, 1473, where his father had become a citizen ten years before; died at Frauenburg in 1543. It is supposed that his family came originally from Westphalia. From a school at Thorn Copernicus went to Cracow, where he studied medicine, and received the degree of doctor. At the same time he studied mathematics and astronomy. The fame of Peurbach and Regiomontanus, the restorers of astronomy in Europe, excited his emulation. At the age of twenty-three he went to Italy, where the arts and sciences were beginning to flourish after the fall of the Byzantine Empire. At Bologna he was instructed in astronomy by Dominicus Maria, whose intimate friend he became. In 1500 he taught mathematics at Rome with great success, and was already placed by the side of Regiomontanus. From Rome he returned to his own country, where his uncle had made him a canon in the cathedral of Frauenburg.

He now applied his whole strength to the contemplation of the sublime objects of nature. Among the many hypotheses, with regard to our planetary system, which had been advanced during the previous 2000 years, one had at last prevailed, the most ingenious and artificial, and the most wonderful mixture of sagacity and error which the human mind has ever conceived. Pythagoras, Aristotle, Plato, Hipparchus, Archimedes, and others, had all adopted it. It was called the *system of Ptolemy*. Copernicus doubted whether the motions of the heavenly bodies could be so confused and so complicated as this hypothesis would make them. He found in the writings of the ancients that Nicetas, Heraclides, and Ecphontus had thought of the possibility of a motion of the earth. This induced him to examine the subject more fully. The hypothesis of Aristarchus of Samos, that the earth revolves in an oblique circle around the sun, and also revolves daily on its own axis, Copernicus could not yet have seen; for it is found in no work previous to his time except the Arenarius of Archimedes, which was first printed at Venice, at a later period. Copernicus now assumed that the sun was the centre of the system; that the earth was a planet like Mars and Venus; and that all the planets revolve round the sun in the following order: Mercury, in 87 days; Venus, in 224; the Earth, in 365; Mars, in one year and 321 days; Jupiter, in eleven years; and Saturn in twenty-nine years. Although Copernicus knew that the planetary orbits are not circles having the sun in the centre, he was not able to determine exactly their form. This was reserved for Kepler, who completed what may be called the Natural History of the subject, and stated his three celebrated laws in the end of the sixteenth century. Thus Copernicus stands,

as it were, upon the boundary-line of a new era. (See EARTH and ASTRONOMY.) His great countryman, Kepler, has described his character in the following words: 'Copernicus, vir maximo ingenio, et quod in hoc exercitio magni momenti est, animo liber.' The great and excellent character of this philosopher best appears in the letter with which he addresses his work to the pope. Excommunication, however, was issued from the Vatican against Copernicus, and it was not till 278 years after the publication of the work, in 1821, that the Papal court annulled the sentence.

Let us review the progress of Copernicus' discovery. He commences his labours at a time when the belief in the immobility of the earth is universal. He conceives the idea of its motion, and pursues it with unwearied diligence, not for a few years, but through the greater part of his life, constantly comparing it with the appearances in the heavens. He at last confirms his idea, and thus becomes the founder of a new system of astronomy. All this he did a hundred years before the invention of telescopes, with miserable wooden instruments, on which the lines were often only marked with ink. In his immortal work, dedicated to the pope, Paul III., De Orbium cœlestium Revolutionibus, libri vi. (which was completed in 1530, although first published at Nuremburg, 1543, folio; later editions appeared at Basel, 1566, at Amsterdam, 1617, and at Warsaw in 1851), his system is developed. Besides his principal work, we have by the same author Astronomia Instaurata, in six books, and a work, De Lateribus et Angulis Triangulorum. The first biography of Copernicus was written by the mathematician Gassendi (published in 1654), and for two hundred years this work served as the basis of all subsequent biographies of the great astronomer; but in more recent times the labours of Prowe, Czynski, Szulc, and Bartoszewicz have helped us to a better acquaintance with the facts of his life. Count Sierakowski erected a monument to his memory, in St. Ann's Church at Cracow, with this inscription taken from the Latin Vulgate Bible: 'Sta, sol, ne moveare' (Sun, stand thou still). Thorwaldsen, the greatest sculptor of our time, executed a colossal statue of Copernicus, for the city of Cracow, which is one of the noblest specimens of modern art. Another statue of him by F. Tieck has been erected to him in his native town.

COPIAPÓ, or SAN FRANCISCO DE LA SELVA, a town in Chili, South America, the capital of the province of Atacama, the centre of an important mining district. Silver and copper are the chief minerals obtained, but gold is also found. There is a railway connecting it with the port of Caldera. In 1819 and 1822 it was destroyed by earthquakes; and on the 26th of May, 1851, it was again seriously damaged by one. Pop. 13,400.

COPLEY, JOHN SINGLETON, a self-taught and distinguished painter, was born in 1737, in Boston, Massachusetts, and died in London in 1815. After a visit to Italy, whither he went in 1774, he came to settle in London, where he became a member of the Royal Academy in 1783. The picture which secured his being enrolled as a member of that society is that styled the Death of Lord Chatham, now in the National Gallery, and is the most celebrated of all his works. Among his pictures may be mentioned the Siege and Relief of Gibraltar, painted for the council chamber of the Guildhall; Major Pierson's Death on the Island of Jersey; Charles I., in the House of Commons, demanding of the Speaker Lenthall the Five Impeached Members, containing the portraits of the most distinguished members of that house; the Surrender of Admiral De Winter to Lord Duncan, on board the *Venerable*, off Camperdown; Samuel and Eli, &c.; of all of which engravings exist.

COPPER (Greek, *chalkos;* Latin, *æs Cyprium*). This metal has been known from the earliest times; it is regularly referred to by ancient writers, and articles made of it, and of its alloys, weapons, tools, domestic utensils, coins, ornaments, &c. &c., from all countries, and apparently of all dates, remain abundantly to this day. It has been commonly asserted that copper was known and used before iron; but there is no conclusive proof of this, and the notion of a bronze period is hardly tenable. In classical times large supplies of the metal came from Cyprus (whence the name copper); in other countries remains of old copper workings have been met with.

Copper is an abundant and widely distributed element. It occurs both native and combined in a large number of minerals, some of which constitute its ores, and these are found in all countries. It has also been detected in the ash of certain plants, in crabs, snails, and some other lower animals, in the feathers of birds, in eggs, blood, and milk, and in the liver and other parts of man. In some of these cases its presence is accidental, but in the lower animals it seems to be normal.

ORES OF COPPER.—1. *Native copper* is of a red colour, but frequently tarnished. Its lustre is metallic: it is flexible, ductile, and malleable: its fracture is hackly. Specific gravity, 8·9. It occurs in branched pieces, dendritic, in thin plates, and rarely in regular crystals, under the form of the cube or octahedron, in the primitive and older secondary rocks. One of the largest masses of this substance ever noticed, supposed to have come from Bahia in Brazil, and now in Lisbon, weighs 2616 lbs.; another, brought from the vicinity of Lake Superior, and now in Washington, weighs 3704; a third mass, from the same district, weighed 80 tons, and blocks weighing 400 tons have also been cut. Native copper is frequently found in connection with the secondary greenstone and red sandstone formation in America. It is also found in grains mixed with quartz in Chili. The native copper of Chili and of Lake Superior contains a considerable quantity of native silver.

2. *Sulphuret of Copper.*—Under this name may be described a series of ores containing copper, sulphur, and variable proportions of other metals, which, by some mineralogists, are conceived to pass into each other, and, of course, are improperly arranged as distinct species. Its principal varieties are the vitreous copper ore, the purple copper, gray copper, and yellow copper pyrites.

a. Vitreous Copper, or *Copper Glance* (Cu_2S), is of a lead or iron-gray colour. It occurs crystallized in regular six-sided prisms, mostly modified on the terminal edges, and in acute, double six-sided pyramids, with triangular planes. It also occurs massive. The cross-fracture of the crystallized is often conchoidal with a vitreous lustre: the massive varies greatly in respect of hardness and colour. It is sometimes sectile and soft. The fracture is even, or flat conchoidal. Specific gravity, 4·8 to 5·8. It consists of 81 copper and 19 sulphur. It occurs in veins and beds in primitive and early secondary rocks, and is found with other ores of copper. In the United States it has been met with very often in the old red sandstone, but is nowhere wrought as yet to advantage. It abounds in Cornwall and many European countries.

b. Purple Copper, or *Erubescite* ($Cu_6Fe_2S_6$), occurs both massive and crystallized. Its colour is brownish-red, and is often possessed of an iridescent tarnish, in which blue is apt to prevail. The general form of the crystal is that of a cube, of which the solid angles are replaced. It is soft, easily frangible, and sectile in a

slight degree. Specific gravity, 5·033. That of Norway consists of copper 69·50, sulphur 19, iron 7·50, and oxygen 4. It is fusible into a globule, which acts powerfully upon the magnetic needle. The purple copper is found in Norway, Saxony, and England, and occurs under similar circumstances with the other ores of copper.

c. The *Gray Copper, Fahlerz,* or *Tetrahedrite,* is of a steel-gray or iron-black colour. It occurs crystallized in the form of the tetrahedron, in which no regular structure is visible; it also occurs massive and disseminated. Its fracture is uneven or imperfectly conchoidal, with a shining or glistening metallic lustre. It is brittle. Specific gravity, 4·5. It consists of from 30 to 40 per cent. of copper, with iron and sulphur; but it also contains, mixed with these constituents, other metals, in very variable proportions, as zinc, lead, antimony, and silver. It occurs in Russia, France, Spain, England, Chili, and Mexico, and is one of the most abundant and important ores of the metal.

d. Yellow Copper Ore, Copper Pyrites, or *Chalcopyrite* ($Cu_2Fe_2S_4$), occurs of various shades of yellow, often with lively iridescence, crystallized in the form of the tetrahedron, having the solid angles replaced, and massive. It is also stalactitic and botryoidal. It is brittle, yields to the knife, and may thereby easily be distinguished from iron pyrites, which it often much resembles. It has metallic lustre, and is opaque. Specific gravity, 4·3. It contains copper 30, iron 32·20, sulphur 35·16, earthy matter 0·50, lead, arsenic, and loss, 2·14. It is the most abundant of all the ores of copper, and affords almost exclusively the copper of commerce. It exists both in primitive and secondary rocks, and is accompanied by most of the other ores of copper, sometimes galena, oxide of tin, and several of the ores of iron. It is found in North and South America, most European countries, Japan, and Africa. The quantity produced in the United Kingdom in 1860 (chiefly from Devon and Cornwall), was 15,968 tons, value £1,706,261; in 1871, 6280 tons, value £475,143.

3. *Red Oxide of Copper* (Cu_2O) is of a red colour, varying greatly in its shades, and, by transmitted light, often of a crimson red. It occurs crystallized in the form of the octahedron and its varieties, which are very numerous. The crystals are externally splendent, but sometimes of a lead-gray colour, with a metallic lustre. The cross-fracture is sometimes uneven; oftener conchoidal with a splendent and somewhat adamantine lustre. It is transparent or translucent, yields easily to the knife, and is brittle. Specific gravity, 5·6 to 6·15. It consists of 88·5 copper and 11·5 of oxygen. Red oxide of copper is also found in delicate capillary crystals, as well as massive, when it is opaque, and frequently granular in its fracture. The brick-red or *tile copper ore,* which occurs earthy or a little indurated, appears to be a mixture of oxide of copper and oxide of iron. This species is found in the primitive and transition rocks, associated with the other ores of copper. It is found finely crystallized in the English mines, and at Chessy, in France.

4. *Black Oxide of Copper,* or *Melaconite,* is cupric oxide (CuO) mixed with the oxides of iron and manganese, pyrites and earthy impurities. It is met with in Cornwall, in France, and especially in Chili and at Lake Superior. It is black and pulverulent or massive, but sometimes is crystallized, and seems to be the result of the weathering of purple copper and other ores.

5. *Carbonate of Copper.*—Oxide of copper, combined with carbonic anhydride, forms two species—the blue and the green carbonate.

a. Blue Carbonate, Azure Copper Ore, or *Chessylite* ($2CuCO_3,CuOH_2O$), is found in shining translucent crystals, whose figure is that of oblique rhombic prisms, variously acuminated, and modified by secondary planes. The colour is azure-blue, frequently of great intensity, and the lustre vitreous. It sometimes occurs in an earthy form as an incrustation, and is occasionally massive, without lustre. It consists of 69 oxide of copper, 25·4 carbonic anhydride, and 5·4 water. It occurs in the copper mines of England, and of European countries generally; also in South America, and the Burra Burra mines in Australia, and especially at Chessy, near Lyons, in beautiful crystals.

b. Green Carbonate of Copper, or *Malachite* ($CuCO_3CuOH_2O$), occurs massive, disseminated, and crystallized in capillary and acicular crystals. Its colour is green, and the lustre of the fibrous varieties silky and pearly. It is usually in reniform or botryoidal masses. It is soft and brittle, but admits of a beautiful polish, and is highly esteemed in inlaid work. It occurs along with the other ores of copper. The finest specimens are brought from Siberia, and it is the principal copper ore of South Australia.

Among other copper minerals the following may be referred to.

Phosphate of Copper, a rare ore, which was formerly regarded as malachite. It occurs massive, disseminated in minute prismatic or octahedral crystals, of a green colour. It is found in Hungary and in the Ural. There are several varieties.

Muriate of Copper, or *Atacamite* ($CuCl_2,3CuO$), is another rare species, which occurs in angular grains, of a bright green colour, among the sands of the river Lipas, in the desert of Atacama, separating Chili from Peru; also in minute prismatic crystals, of an emerald-green colour, on brown ironstone, at Remolinos, in Chili, and it has been met with in the lava which buried Herculaneum and Pompeii. It is soft and brittle. Specific gravity, 4·4. It tinges the flame of the blowpipe of a bright green and blue, hydrochloric acid fumes are evolved, and a bead of copper remains on the charcoal.

Arseniate of Copper.—Copper, combined with arsenic acid, forms several species. One, *liroconite,* occurs crystallized in the form of an obtuse octahedron. Its usual colour is sky-blue, sometimes apple or grass green. It is translucent, shining, and brittle. Specific gravity, 2·881. It consists of oxide of copper 37, arsenic acid 23, and 25 of water. A second, *chalcophyllite, copper mica,* is crystallized in hexahedral tables, bevelled on the terminal planes. Its colour is deep emerald-green, with considerable lustre and transparency. It is less hard and less heavy than the foregoing species, but its composition is not constant. A third, *olivenite,* the *right prismatic arseniate of copper,* is crystallized in the form of an acute octahedron, the crystals being sometimes capillary, in some specimens appearing as delicate fibres, and sometimes in layers, flat or mammillated, and of a fibrous texture. The colour in these is dark olive-green, passing into brown or yellow, or greenish-white. It is often transparent; it is harder than the preceding species, and is much heavier. It consists of 50 parts of oxide of copper, from 30 to 40 of arsenic acid, with 3 or 4 of water. A fourth, *abichite* or *clinoclase,* occurs crystallized in trihedral prisms, generally extremely small: they are of a beautiful bluish-green colour, but, from decomposition, often black; when unaltered they are transparent. It consists of 54 oxide of copper, 30 arsenic acid, and 16 water. All the foregoing species are found along with other copper ores in the English mines.

Besides these there are minerals containing copper

combined with selenium, with vanadic, silicic, and sulphuric acids, &c.

METALLURGY OF COPPER.—Copper is extracted from its ores either by the dry or the wet process.

The simplest form of the dry process consists in reducing the ore, which must consist of pure oxide or carbonate, by heating it with carbon. But as the most abundant ores contain sulphur and iron, and generally arsenic, with other metals, and are not amenable to direct reduction, a different process has to be resorted to. It falls into two parts: 1st, the separation of pure sulphide of copper from the ore; 2d, the reduction and purification of the copper.

1st. The ore is first broken into convenient pieces, and different qualities are selected and mixed so that the different earthy matters of the ores shall act as fluxes for one another. It is then roasted for about twelve hours in a reverberatory furnace, heated by a mixture of bituminous coal and anthracite, the ore being turned over from time to time to prevent it fusing and to expose fresh surfaces to the air. In this operation the iron loses sulphur and combines with oxygen, the arsenic is volatilized as arsenious oxide, and part of the sulphur is converted into sulphurous anhydride. These latter products being very noxious if allowed to escape into the air are generally condensed, the sulphurous anhydride being utilized for the manufacture of sulphuric acid. Various forms of furnace and condenser have been devised for the purpose. The calcined ore is transferred to another reverberatory furnace, where it is mixed with silicated ores free from sulphur, slags, consisting of oxide of iron, oxide of copper and silica, from a subsequent process, and fluor-spar, if the earthy matter do not readily fuse. The heat being raised, the slag and then the metallic compounds begin to fuse, and sulphurous anhydride escapes. The mass is stirred to separate the slag, and after five to six hours heating the metallic compound, technically called *matt*, *regulus*, or *coarse metal*, and consisting of copper, sulphur, and iron, is run into a box immersed in cold water, by which operation it is granulated. The black glassy slag from this process is a silicate of iron, with a little copper regulus adhering to it. When possible the regulus is separated. The granulated coarse metal is next returned to the first calcining furnace, where it is roasted to expel sulphur and convert the iron into oxide. After twenty-four hours, during which time the charge becomes much less fusible, the operation is finished, and the charge is transferred to a furnace resembling the second, and is there subjected to a process similar to that for coarse metal. The roasted ore, consisting of oxide of iron, sulphide of iron, and sulphide of copper, is mixed with slags from other parts of the operation and some pure ores of copper consisting of carbonate or oxide. The mixture is heated for about the same time as the mixture for coarse metal, when it divides into a slag of silicate of iron and a matt of tolerably pure sulphide of copper, called *fine metal*, which is either granulated by running into water or cast into ingots. As the slag contains a considerable proportion of metallic copper and copper oxide, it is used in the preparation of a fresh quantity of coarse metal. The fine metal varies a good deal in its composition, in one part consisting of sulphide of copper alone, and in another containing in addition lead, tin, and other metals in considerable amount. This concludes the first part of the operation.

2d. Reduction and purification of the copper. The conversion of the fine metal into metallic copper is effected by heating the fine metal in a furnace, first with free contact of air until part of the sulphur is burned off and the copper is converted into oxide. When this action has gone on long enough, and the oxide and sulphide are in the right proportion, the furnace is closed, and the heat raised to the fusion point, when a reaction takes place between the two. The sulphur and oxygen combine, sulphurous anhydride escapes, and metallic copper is left. A little slag containing copper is also produced, which is used in the fusion for fine metal. The copper is cast into slabs, and constitutes blister copper, this appearance being caused by the escape of sulphurous acid.

The blister copper is finally refined. The slabs are built up in a furnace and roasted for several hours, by which sulphur, arsenic, and other volatile impurities are burned off, while iron, lead, and other metals, and part of the copper, are oxidized. When this is finished the heat is raised to the melting-point, some slag forms on the surface, and when this is raked off and the metal underneath is found in a satisfactory condition, a layer of charcoal or anthracite is spread over it, and the operation of *poling* is begun. This consists in stirring the molten copper with the green stem of a young birch-tree, the effect being to make the copper quite tough. The explanation given is that the copper contains some oxide, which renders it brittle, and that this is removed by the carbon of the wood. If the poling be too long continued the metal becomes brittle again, and in this condition it is said to be *overpoled*, but this is neutralized by allowing the air to act upon it.

The quality is ascertained by taking a sample out of the furnace, cooling it, cutting it half through, and breaking it across. If the colour is a fine red, and the structure is hackly, fibrous, and silky, the operation is concluded, and the copper is cast into ingots; but if not, the toughening process has to be repeated. Even after all these operations the copper is not chemically pure, but contains traces of arsenic, lead, and other metals, which can only be removed by complex operations on the small scale.

The preceding is the Welsh process of copper-smelting, and is that by which the greater proportion of copper is manufactured in this country. It is very elaborate, because it deals with a number of bodies; but its complexity is greater than appears, because it has frequently to be modified to suit different kinds of ores.

Several other methods of extracting and refining are followed at different places on the Continent, such as Chessy near Lyons, Seville, and Mansfeld. In these localities, however, the differences exist not so much in the general process as in the form of apparatus, the length of time spent in the different steps, and the fuel employed. Thus, at Mansfeld, where the ore is a bituminous shale containing a little copper pyrites disseminated through it, the roasting is performed in heaps of the ore mixed with brushwood, which burn for many weeks. The fusion for coarse metal is carried on in a small blast-furnace in which charcoal and gas-coke are burned, the matt and slag being received in pots built in the furnace. The calcination of the coarse metal is accomplished in an open furnace divided into compartments, to which the ore is successively transferred. One of the products of this operation is sulphate of copper, which is removed by repeated washing, crystallized, and sold. The fusion for fine metal is also performed in a small blast-furnace, but at this stage there is got, in addition to the fine metal (a compound of copper and sulphur), impure metallic copper of a dark colour, which sometimes contains silver in sufficient quantity to pay extraction. This black copper is refined by heating in a current of air, which removes volatile matters and converts the inferior metals into slag. The copper, however, is also oxidized, and is consequently brittle, so that it requires to be toughened, which is effected by keeping it

melted under a layer of charcoal until the oxygen is removed. In this, as in the Welsh process, modifications to suit particular circumstances require to be introduced at the discretion of the smelter and refiner.

The wet process for the extraction of copper is twofold in character—1st, the conversion of the ore into a soluble form; 2d, the precipitation of the copper. In some mines the combined action of air and water upon copper pyrites converts the ore into sulphate of copper and iron, and this, on the addition of iron, yields metallic copper. This was observed by early miners, and some of the old chemists quoted the action as an evidence of transmutation. Last century the waters of these mines began to be collected and the copper extracted, and then the operation was hastened by roasting the ore, so as to convert the sulphide into sulphate. On lixiviating with water the copper sulphate dissolved, and was decomposed by iron. The copper waters of the Anglesea and Wicklow mines are still worked after this fashion. Elsewhere the methods at present in use are principally two. At Alderley Edge in Cheshire the ore consists of cupric carbonate, contained in sandstone. The sandstone is crushed, dissolved in hydrochloric acid, and the chloride of copper precipitated by scrap-iron. Sulphur-ores are treated differently. The pyrites is first roasted to get rid of the larger proportion of the sulphur, which is converted into sulphuric acid; and then the calcined residue still containing sulphur is mixed with common salt, ground, and heated in ovens. The copper is thus converted into chloride, part of which volatilizes, but is condensed, along with arsenic and other substances, by passage through flues and water-condensers. After some hours the calcined mixture is raked out of the ovens, cooled, and transferred to tanks, where it is exhausted by successive treatment with water. The solution, containing chloride of copper, sulphate and chloride of sodium, and iron salts, is next heated along with scrap-iron. Copper precipitates in the form of a ruddy, lustrous, tolerably compact mass, with a crystalline appearance, and mixed with metallic-iron and oxide. The larger pieces of iron are picked out, the precipitate washed and drained, and then rendered compact by heating in a furnace. A slag containing the oxide of iron forms, and the copper, when judged sufficiently pure, is run into moulds. Afterwards this crude metal is refined and toughened in the usual way, and the slags are employed as in the Welsh process.

Copper is sold in various forms—in ingots of different sizes, in square plates or slabs, and in small grains, produced by pouring the metal into water.

Copper is the only metal which has a red colour. Its specific gravity is 8·96. It is moderately hard; very malleable, ductile, and tenacious; and its conducting power for heat and electricity is inferior only to that of silver. It has a distinct odour, and a nauseous metallic taste. Its compounds are poisonous. It melts at a full red-heat, and crystallizes from a fused mass in octahedrons. Heated to redness in the air it oxidizes, and becomes black and scaly. It is attacked readily by nitric acid, dissolves in boiling sulphuric acid, but is acted on by hydrochloric acid with difficulty.

Copper forms two classes of compounds—the cuprous and cupric, of which the second is the more important.

The cupric oxide occurs native, and it is formed when copper is heated in the air. It is more conveniently prepared by heating the nitrate until nitrous fumes cease to be evolved. It is a bluish-black powder, insoluble in water, but hygroscopic, which fuses at a higher temperature, and becomes crystalline on cooling; with proper precautions distinct crystals can be obtained. It is soluble in acids, forming cupric salts which have a green or blue colour, and from which the oxide can be reprecipitated by an alkali, in the form of a greenish-blue hydrate, which loses water, and becomes brown if the liquid be heated.

The cuprous oxide also occurs native, and is easily prepared from a cupric salt, such as the sulphate, by heating the solution with grape-sugar in presence of potash. A yellow precipitate forms, and this by continued heating becomes red, which is the true colour of the oxide. It is quite permanent at the ordinary temperature, but if heated in the air it absorbs oxygen, and passes into cupric oxide. When fused with glass it gives it a fine ruby-red colour. Both oxides are readily reduced to the metallic state if heated in contact with hydrogen or with carbonaceous matter.

The other cuprous compounds, such as the chloride, bromide, iodide, sulphide, are prepared from this oxide, or from the corresponding cupric compound, by the addition of metallic copper, or by the action of some reducing substance. The most curious compound of this class is the cuprous hydride, which is a precipitate, yellow at first, and then reddish-brown. When treated with hydrochloric acid it dissolves as cuprous chloride with evolution of hydrogen. As a general rule the cuprous compounds are colourless or pale; they are unstable in solution, and are apt to absorb oxygen from the air and pass into the cupric state.

Of the other cupric compounds the following may be mentioned:—The *chloride* ($CuCl_2$), formed when a slip of metallic copper is acted on by excess of chlorine gas. It forms a brown sublimate, with a disagreeable taste, deliquescent, and soluble in water with a green colour, forming the hydrated chloride. It also, like the hydrate, is soluble in alcohol, to the flame of which it imparts a fine green colour. The hydrate can be obtained also by dissolving the oxide or carbonate in hydrochloric acid, and the solution yields on evaporation green deliquescent prisms, which become brown even at 212°. At a higher temperature water of crystallization is all expelled.

The commonest of all the salts of copper is the sulphate, or *blue vitriol* (see CYANOSE). The preparation of this salt on the large scale from pyrites has been referred to above. When metallic copper is boiled with strong sulphuric acid the solution becomes blue, sulphurous anhydride is evolved, and the solution yields crystals of the cupric sulphate ($Cu\,SO_4, 5\,H_2O$). It crystallizes in doubly oblique prisms, which have a blue colour and glassy lustre, but are apt to become white and opaque on the outside. It dissolves in four parts of cold water and two of hot. It is insoluble in alcohol. It has a very offensive styptic taste, and is extremely poisonous. At a low temperature it readily loses part of its water of crystallization, but the last part is only expelled at a dull red heat. The anhydrous salt is pulverulent, and almost white. When thrown into water it reassimilates water of crystallization, heat being evolved. Heated to a sufficiently high temperature, the salt is completely decomposed. The sulphate of copper is largely used in the arts for making green paints, for telegraph batteries, for calico-printing, and other purposes. It is also used in medicine.

The nitrate of copper is got by dissolving the metal, or its oxide or carbonate, in nitric acid. It is readily soluble in water, from which it deposits in fine blue crystals. It is very corrosive, and acts readily as an oxidizing agent. Thus when wrapped in tin-foil, the tin is oxidized with such rapidity that it sometimes catches fire. The nitrate of copper in

solution is used by dyers and printers for dyeing black, brown, and other tints, with certain colouring matters.

The arsenite of copper is a bright green powder, better known as Scheele's green. There are other green copper paints, Schweinfurth green, verdigris, verditer, of varying composition.

The native sulphides of copper have been already referred to. The cupric sulphide is thrown down when sulphuretted hydrogen or an alkaline sulphide is added to a salt of copper. It is a blackish-brown amorphous powder, insoluble in water and dilute acids, but readily attacked by nitric acid.

Copper is acted on more or less rapidly by organic acids and vegetable juices containing acids. As the compounds formed are somewhat soluble, and, like the other compounds of copper, poisonous, great care is necessary in the employment of copper and brass vessels for culinary purposes.

The presence of copper in a substance is easily detected. If it be a solution, a slip of iron or zinc immersed in it will acquire a red colour from the deposition of the metal. It is also readily detected by the deep blue colour produced when a slight excess of solution of ammonia is added. This blue solution is formed even with solid copper, if only air and ammonia act on it conjointly. Copper is peculiar in its relations to ammonia. Its salts absorb the gas, forming crystalline compounds in which the copper and ammonia have combined with each other to form what modern chemistry terms a metallammonium.

Alloys of Copper.—Of these bodies a great number are known. *Aluminium bronze* contains 90 per cent. of copper and 10 per cent. of aluminium. It is very tenacious, hard, and malleable. It has a golden-yellow colour, which does not easily tarnish, and the alloy is otherwise not readily affected by chemical reagents. With metallic arsenic copper forms white bodies, which, however, have more the character of definite compounds than alloys. One of them is employed for making candlesticks, dials, and such like articles. Another occurs native in Chili, and is called *domeykite* by mineralogists. When alloyed with gold and silver copper communicates hardness to them without much impairing their ductility or debasing their colour; hence it is employed in the standard alloys, that of gold containing one-twelfth, that of silver one-sixteenth of the mass. With platinum it forms a ductile alloy susceptible of a fine polish.

But the most numerous and varied alloys of copper are those containing tin and zinc, and sometimes other metals, lead, &c.

Bronze is an alloy of copper with about 8 or 10 per cent. of tin, together with small quantities of other metals, which are not essential to the compound. Cannons are cast with an alloy of a similar kind, and the ancient bronze statues were of nearly the same composition. The modern British bronze coinage consists of copper 95, tin 4, zinc 1. (See Bronzes.) *Bell-metal* is composed of eighty parts of copper and twenty of tin. See Bell.

Brass.—Copper and zinc unite in several proportions, forming alloys of great importance in the arts. The best brass consists of four parts of copper to one of zinc; and when the latter is in greater proportion, compounds are formed called *tombac*, *Dutch gold*, and *pinchbeck*. An alloy called *Bath metal* is made by adding 9 lbs. of zinc to 32 of brass; and an extremely pale, nearly white metal, used by the button-makers of Birmingham, under the name of *platina*, by adding 5 lbs. of zinc to 8 of brass. The brothers Keller, who were very celebrated statue-founders, used an alloy, 10,000 parts of which containing 9140 of copper, 553 of zinc, 170 of tin, and 137 of lead. Their castings are famous, and some were of very large size, as the equestrian statue of Louis XIV., cast at a single jet by Balthazar Keller in 1699, which was 21 feet high, and weighed 53,263 French pounds. These statues are usually called *bronze* statues, although made of brass. See Brass.

The art of *tinning* copper consists in covering that metal with an extremely thin layer of tin in order to protect its surface from rusting. For this purpose pieces of tin are placed upon a well-polished sheet of copper, which, if the process is skilfully conducted, adhere uniformly to its surface. The oxidation of the tin—a circumstance which would entirely prevent the success of the operation—is avoided by employing fragments of resin, or sal-ammoniac, and regulating the temperature with great care.

Copper, being ductile and easily wrought, is applied to many useful purposes. It is formed into thin sheets by being heated in a furnace, and subjected to pressure between iron rollers. These sheets being both ductile and durable are applied to a variety of uses, such as the sheathing of the bottoms of ships, the covering of roofs and domes, the constructing of boilers and stills of a large size, &c. Copper is also fabricated into a variety of household utensils, the use of which, however, for preparing or preserving articles of food, is by no means free from danger, on account of the oxidation to which copper is liable. It has been attempted to obviate this danger by tinning the copper, as above described. This method answers the purpose as long as the coating of tin remains entire. Copper may be forged into any shape, but will not bear more than a red heat, and, of course, requires to be heated often. The bottoms of large boilers are frequently forged with a large hammer worked by machinery. The bolts of copper used for ships, and other purposes, are either made by the hammer, or cast into shapes, and rolled. The copper cylinders used in calico-printing are either cast solid upon an iron axis, or are cast hollow and fitted upon the axis. The whole is afterwards turned, to render the surface true.

COPPERAS, or Green Vitriol, occurs native both dissolved in the water of mines and of certain springs, and in the solid form, either massive, pulverulent, botryoidal, or crystallized in oblique rhombic prisms. It is met with in the Whitby and Hurlet shales, in Dorsetshire, and other parts of Britain, in different localities in Germany, and in the United States. It has a green colour, but is usually coloured yellow externally, has a vitreous lustre, is insoluble in spirit, but is readily soluble in water, the solution being acid and styptic, and giving the reactions of iron. Specific gravity, 1·83. It is produced by the weathering of iron pyrites, and when pure consists of ferrous sulphate, $FeSO_4 7H_2O$, but common copperas usually contains a quantity of ferric sulphate in addition. It has been known from classical times, and has always been largely employed. Thus it is used in medicine, in tanning, in dyeing to produce black colours, and to darken the shades of others; in preparing ink, Prussian blue, and Nordhausen, or fuming sulphuric acid, and the quantity consumed in this way is so great that it is necessary to make the salt artificially. This is done by mining the pyrites, exposing it to free contact with the air, and pouring water upon the heap from time to time as required. The liquor which drains away is collected, evaporated, and crystallized. It is also prepared from the iron liquors got in the wet extraction of copper (which see), and even by dissolving iron in sulphuric acid. The chief impurities are salts of copper, aluminium, calcium, and magnesium. The mineral called *white copperas*, or *coquimbite*, because found in Coquimbo in Chili, and also produced by the action of the atmosphere upon iron pyrites, is a ferric

sulphate, and differs therefore from ordinary copperas in constitution as well as in properties.

COPPER-FASTENED. A ship is said to be copper-fastened when the bolts and other metal-work in her bottom are made of copper and not iron, so that there is no danger of the copper-sheathing corroding the heads of the bolts by galvanic action, as ensues when copper and iron are in contact with sea-water.

COPPERING, sheathing a ship's bottom with thin sheets of copper, to prevent the teredo or ship-worm eating into the planks, or to keep shells and weeds from accumulating on the surface, and so retarding a vessel in her sailing.

COPPERMINE RIVER, a river, British North America, which falls, after a course of about 250 miles, into the Arctic Ocean, at the Duke of York's Archipelago, in lat. 67° 40′ N.; lon. 115° 37′ W.

COPPET, a village, Switzerland, canton Vaud, on the lake and 9 miles N.N.E. Geneva. It is only remarkable for its château, with gardens and park, once the residence of Bayle (1670–72), afterwards of the financier Necker (who is buried here), and his celebrated daughter, Madame de Staël-Holstein. Pop. about 500.

COPPICE, or COPSE WOOD, the name given to trees which, before they attain the size of timber, are cut down periodically as they spring from their stools and attain a certain size. In a few situations, as on small islands, and along the banks of lakes and rivers, it may be more ornamental than grown timber, but the object contemplated in forming it is the profit which it may be made to realize. The most valuable tree thus employed is the oak, which is cut down periodically at intervals varying, according to soil and climate, from fifteen to twenty-five or thirty years, and after paying all expenses, often yields from £30 to £50 per acre in bark used for tanning, and wood convertible into wheel spokes, or applicable to other purposes. The stems, cut over near the ground, are carefully dressed and rounded, so as to prevent them from rotting; in a short time a number of shoots appear, all of which are thinned away except three or four of the most promising, which are left to grow till they again become fit for another periodical cutting. When plantations are extensive, the method usually followed is not to allow all the copse to come to maturity at the same time, but to divide it into a number of sections, in Scotland provincially called *hags*, and to cut one of them annually, so as to yield a revenue with as much regularity, and not unfrequently to as large an amount, as an equal quantity of land under regular culture. For instance, a copse of 100 acres, on the assumption that it may be profitably cut after twenty years' growth, is divided into twenty sections of 5 acres each. By cutting only one of these sections annually a perpetual succession of cuttings is obtained, yielding, on the most moderate calculation, a clear income of at least £100 per annum. The proprietors of many of our Highland glens by pursuing this method have materially increased the value of their estates. The other kinds of wood commonly used for copse, particularly in the southern part of the island, are chestnut, which, from its durability even when partly inserted in the ground, is valuable for hop poles, posts, &c.; ash, preferred for all purposes where strength and elasticity are required; and hazel, admirably adapted for barrel hoops, and in great demand for crates in the vicinity of potteries. The willow, well known for its uses in basket-making, being cut down regularly after every year's growth, scarcely falls under the head of *copse*.

COPROLITES, the term originally applied to the fossil excrements of extinct animals found most abundantly in the lias, greensand, and Suffolk crag. They consist chiefly of phosphates of calcium and magnesium, and the carbonates of the same metals, and organic matter, and as the fertilizing properties of these are well known, coprolites have been largely used as a manure. For this purpose they are reduced to powder and used as ground bones, or treated with sulphuric acid, so as to form superphosphate of lime.

COPT, a name given to the Christians of Egypt belonging to the Jacobite or Monophysite sect, is a term of Arabic formation, in all probability a corruption of the Greek word *Aiguptos* (Egypt), converted by the Arabs into *Kubti* or *Kibti*, pronounced *Gubti* or *Gybti* by the Egyptians. The Jacobites, who were exclusively of pure Egyptian blood, and far more numerous than their adversaries the Melkites (Greeks in faith as well as origin), having been persecuted as heretics by the Greek emperor, were, on the invasion of Egypt by the Saracens, willing to submit to the arms of Amru, the Arabian commander, who granted to them immunities which they had not previously possessed, and protected their church from the encroachments of the Constantinopolitan see. But the Copts soon found that their privileges would be of little avail under oppressive or fanatical princes. Their wealth, numbers, and respectability rapidly declined; and though rarely intermarrying with their conquerors, and preserving their features, manners, and religion unaltered, they soon lost their language, which had resisted the influence of a Grecian court for so many ages. In person and features the Copts differ much from the other natives of Egypt, and are evidently a distinct race. According to the younger Champollion they are the result of a mixture of all the different races that have ruled over Egypt. Reduced by a long course of oppression and misrule to a state of degradation, their number and national character have rapidly declined; so that at the highest calculation they do not now amount to more than between 150,000 and 160,000, although at the time of the Saracen invasion already referred to their number is said to have reached 600,000. Their costume resembles that of the Moslems, but they are very generally in the habit of wearing a black turban for distinction's sake. The men pay a special tribute, or poll-tax, in addition to all the other taxes laid on the rest of the inhabitants of the districts where they live; but they have some compensation in not being subject to military service. The women go out with veiled faces, like the other females of the country. There are numerous schools for their male children, but very few of the females are taught to read. Baptism is practised; and children are more generally circumcised; confession is required of all, and is always insisted on before a party applying can receive the sacrament. The head of the Coptic Church is the Patriarch of Alexandria, who, though he still retains this title, now resides at Cairo. He is always chosen from among the members of the monastery of St. Macarius, or that of St. Antony, and is either named by his predecessor or selected by lot. He is regarded as the successor of St. Mark, by whom the Copts believe that Christianity was introduced among them. Next to him are the bishops, twelve in number, who are appointed by the Patriarch of Alexandria. There are also arch-priests, priests, deacons, and monks. In connection with the Coptic Church there is a metropolitan of Abyssinia, who is appointed by the Patriarch of Alexandria. They are quiet, industrious, and saturnine, but are often represented by travellers as crafty, fraudulent, and revengeful. All, however, allow that they show a capacity and disposition which, under more favourable circumstances, would raise them to a respectable rank in the scale of civilized nations.

COPTIC LANGUAGE, the language formerly spoken by the Copts or Egyptian Christians, and regarded as the direct descendant of the ancient sacred language of the Egyptians. As such it has afforded to Champollion, Dr. Young, and others the key to the interpretation of the Egyptian hieroglyphic inscriptions. At the time of the introduction of Christianity among the Copts the hieroglyphic, hieratic, and demotic modes of writing previously in use in Egypt were abandoned, and the Greek alphabet was adopted, with the addition of six characters of the demotic alphabet, which were retained because the equivalents to them were wanting in the Greek alphabet. These six letters represented *kh*, *h*, *f*, the English *j*, and two forms of *sh*. By the time that this change was made the Coptic language was no longer the same with the ancient sacred language, but had adopted a number of words from the vernacular language which was spoken in Egypt alongside of the former, besides a large number of others from the Greek, the Latin, the Arabic, and other sources. It still remained, however, essentially Egyptian. The Coptic language is monosyllabic in character. All its radical forms are monosyllables, and whenever a polysyllabic word is met with it may be at once affirmed that the word is either a derivative or a compound. As a rule the radicals are capable of certain modifications of form, which always express a modification also of the sense. The meaning of the radical monosyllables is in fact changed by the juxtaposition of other monosyllables, which are the usual signs of genders, numbers, persons, moods, and tenses. The feminine is sometimes formed by a modification of the vowel of the masculine. In the Coptic root syllables there are often final consonants which do not form part of the root. These are called paragogic letters, and can only be explained as instances of the caprice of pronunciation, or as being originally part of the root both in spelling and pronunciation, although in course of time they have been dropped so far as the pronunciation is concerned. According to the German philologist Schwartze the Coptic may be taken as forming a family of languages analogous to the Semitic in its grammar, and allied to the Indo-European languages in its roots. This opinion is supported by various other philologists, such as Bunsen, Meier, and Bötticher, but it is contested by others, among them Pott, Ewald, Wenrich, and Renan. The Coptic language is divided into three dialects—the Theban, which was spoken in Upper Egypt, and which is the best preserved of the three; the Memphitic, or Coptic, strictly so called, which was spoken in Lower Egypt; and the Bashmuric, which was spoken in the Delta. Of the last the literary remains are very scanty, but it is that which comes nearest to the hieroglyphic language of the ancient Egyptians. After the Arabian conquest of Egypt the Coptic language gradually ceased to be spoken, and as early as the tenth century it was no longer in use in Lower Egypt; in Upper Egypt, however, it maintained itself for some centuries longer, but here also it was at last obliged to give way to the Arabic. The theological writings in use among the Coptic Christians, however, are still written in the Coptic language, but an Arabic translation always accompanies them. In the schools the children learn the Gospels and the epistles of the New Testament in Coptic as well as Arabic, but they are no longer taught the former language grammatically. In the various libraries of Europe there are numerous Coptic manuscripts, but most of them are of little interest. At Oxford there exists a very ancient Coptic manuscript entitled Perfect Wisdom, a copy of which has been made by M. Dulaurier by order of the French government. Translations of the Pentateuch and some other books of the Old Testament and of the Gospels into Coptic have been published at Rome. Materials for the study of the Coptic language will be found in the grammars of Peyron (Turin, 1841), Schwartze (Berlin, 1850), and Uhlemann (Leipzig, 1854), and the dictionaries of Peyron (Turin, 1835) and Parthey (Berlin, 1844). See also Recherches critiques et historiques sur la Langue et la Littérature de l'Égypte, by Quatremère (Paris, 1810).

COPY comes from the Latin *copia*, abundance, because *copying* a thing is multiplying it. A copyist ought always to understand his original, whether this be a manuscript or a work of art, to avoid the numerous blunders which he will otherwise make in most cases in which copying is required. In ancient times, when the art of writing was less improved than it is at present, and, at the same time, the art of printing was not in existence in Europe, good copyists were much esteemed. With the Romans they were slaves, and commanded very high prices. In the middle ages, when learning had fled from the world into the convents, the monks were busily engaged in copying the manuscripts of the ancient classics, and others of a later date; but very often they did not understand what they wrote, or did their work carelessly, because copying was often imposed upon them as a penance, so that great labour has been subsequently spent in correcting the errors of the manuscripts of the middle ages. At the time when copying was the only means of multiplying books their price was of course very great; and this was the case even with common books, as the breviary. In the fine arts much more talent is necessary to produce an exact copy of a master-piece than is at first supposed. Without a reproduction of the original in the mind of the copyist his imitation cannot be perfect. He must have the power to conceive and transfer to his own canvas the living spirit of the piece before him. What an immense difference there is between the copy of an artist of genius and the literal exactness of a Chinese! This consideration leads us a step further, to the misconception of the character of painting and sculpture, which would confine the artist to a strict imitation of particular objects in nature. If this were the great aim of the arts, any view of a market would be better than a Teniers, and any landscape superior to a painting of Claude Lorraine. It is true that a cat so painted as to be hardly distinguishable from the living animal, or a drop of water which we try to wipe away, call forth our praise of the artist's skill; but they are only studies. It is the life which breathes throughout nature, and (in the higher branches of the fine arts) the ideals at which nature herself aims which the artist must be able to conceive and to exhibit. It is with the above arts as with the drama. A drama would be an extremely dull, poor, and perhaps vulgar production if all we could say of it were that it is an exact copy of certain particular occurrences. As copies of the great works of art may convey to a considerable degree the same pleasure as the originals, it were to be wished that great sculptors would copy their own works, as Thorwaldsen did his beautiful Triumph of Alexander. The copy is on a reduced scale, and in *terra cotta*.

COPYHOLD, a tenure of estate by copy of court roll; or a tenure for which the tenant has nothing to show except the rolls made by the steward of the lord's court. Copyhold property cannot be now created, for the foundation on which it rests is, that the property has been possessed time out of mind, by copy of court roll, and that the tenements are within the manor. There are two sorts of copyhold; the first is termed *ancient demesne*, or a customary free-

hold; and the second, a *base tenure*, or mere copyhold. The former, customary freeholds or free copyholds, as they are also called, are held according to custom, that is, both according to the general customs which extend to all copyholds and to the particular custom peculiar to the manor in which the copyhold is held, and on these the lord of the manor has no right to encroach. Base tenures, on the other hand, or mere copyholds, are held merely at the lord's will, although the copyholder's interest is nevertheless always regulated by custom. Among the services and incidents extending by general custom to all copyholds are these:—suit of court, by which the copyholder is bound to attend the lord's court and be sworn of homage; the liability of every copyholder on being admitted as heir to the copyhold to pay a fine to the lord of the manor; and the right of the lord to a heriot on the death of a tenant, the heriot being in every case a personal chattel, usually the best beast or *averium*. When the copyholder is a married woman, no heriot is due on her death, as she can have no chattels. The particular customs peculiar to different manors are endlessly various, and it is chiefly this circumstance that makes this mode of tenure so objectionable, and that induced Parliament to pass a law with a view to gradually abolishing copyhold by facilitating enfranchisement. This law is the act of 1858 (21 and 22 Vict. cap. xciv.), and it enables the tenant or lord of any copyhold lands to which the last admittance had taken place, or the last heriot become due before July 1, 1853, to compel enfranchisement, either in consideration of a sum of money to be paid at once to the lord, or of a yearly sum fixed as rent. The law does not absolutely require the conversion of every copyhold into any other kind of holding, but merely puts it into the power of either lord or tenant to do so at their own pleasure. Copyhold commissioners were appointed to carry out the provisions of the act. (Wharton's Law Lexicon.)

COPYING MACHINES. The most convenient mode of multiplying copies of a writing is by lithography, and this mode is much used by merchants and others in preparing circulars; also in the different departments of government. In Hawkins' polygraph two or more pens are so connected as to execute at once two or more copies. Watt's copying-machine is a press, in which moistened bibulous paper is forced into close contact with freshly-written manuscript. The writing is, of course, reversed, but the paper being thin, the characters can be read on the opposite side. Dr. Franklin used to cover writing, while moist, with fine powdered emery, and pass the sheet through a press in contact with a plate of pewter or copper, which thus became sufficiently marked to yield impressions, as in the common mode of copperplate printing. A simple method of copying very often adopted is to interpose a sheet of blackened paper between two thin sheets of writing paper, and then to write firmly with a lead pencil on the upper sheet of writing-paper. Whatever is written with the lead pencil on the upper sheet will be found written also on the lower sheet of writing paper, the marks on the latter being made through the medium of the blackened paper.

COPYRIGHT denotes the property which an author has in his literary works, or which any other person has acquired by purchase, and which consists of the exclusive right of publication; or the right which a designer, engraver, painter, draughtsman, photographer, or sculptor has in his designs, engravings, paintings, &c. The most important of these is the copyright of literary works. In some countries in Europe this right is perpetual; in others, as in Britain, France, and the United States of America, it is for a limited period. In England, the first legislative proceeding on the subject was the licensing act of 1662, which prohibited the publication of any book unless licensed by the lord-chamberlain, and entered in the register of the Stationers' Company, in which was entered the title of every new book, the name of the proprietor, &c. This and some subsequent acts being repealed in 1691, the owner of a copyright was left to the protection of the common law, by which he could only recover to the extent of the damage proved, in case of its infringement. New applications were therefore made to Parliament, and in 1709 a statute was passed (8 Anne, cap. xix.), by which the owner of a copyright was required to deliver a copy of his book to each of nine public libraries, and severe penalties were provided for guarding the property of copyright against intruders for fourteen years, and no longer. In 1801 the act was extended to Ireland, and two additional copies of all works entered in Stationers' Hall were to be delivered: one to Trinity College, Dublin, and one to King's Inns, Dublin. The delivery of eleven gratis copies was burdensome to authors and publishers, especially when the works were of an expensive character and the impression taken was small. Large books with plates, which may cost ten or twenty pounds a copy, and the demand for which is limited, felt it severely.

A decision of the House of Lords in 1774 established that the exclusive right should last 14 years, with a contingent renewal for an equal term, if the author happened to be alive at the end of the first period. The law continued on this footing till 1814, when the right was extended to twenty-eight years, by rendering the last fourteen years certain, instead of leaving them contingent; and if the author were living at the end of that period, to the residue of his life.

But the act of 5 and 6 Vict. cap. xlv., passed July 1, 1842, to amend the law of copyright (called Lord Mahon's Act), is now the law which regulates literary property throughout the British dominions.

This law gives the copyright of a work exclusively to the author for the whole term of his life, and to his heirs for seven years after his death. But if the author should die within forty-two years of the publication of his work, then the copyright continues to his heirs till the whole period of forty-two years from the publication of the work has expired, if it does not expire until at least seven years after his death. The copyright of posthumous works belongs to the proprietors of the manuscripts for forty-two years after the date of publication. In the case of encyclopædias, reviews, magazines, and other periodical works, the copyright is vested in the proprietors as if they were the authors; but after twenty-eight years the copyright of all articles claimed by the authors reverts to them for the period of fourteen years still to elapse under the terms of this act. It is, of course, quite competent to the authors of such articles to reserve the right of publishing them in a separate form by a special agreement with the publisher for whose magazine, review, or encyclopædia they are destined. All copyrights are declared by the act to be special property, and may be disposed of by the owner by sale, gift, bequest, or in any other way. A register of books published under this act is kept at Stationers' Hall. Instead of the eleven public libraries which were formerly entitled to a copy of every book published in the kingdom, only five have had this right since the passing of the act of 1842. These are the library of the British Museum, the Bodleian, the Public Library at Cambridge, the Faculty of Advocates' Library at Edinburgh, and that of Trinity College, Dublin. To the first-mentioned library a copy of every new work must be

presented within one month after publication; the copies intended for the others must be delivered at Stationers' Hall within one month after demand. Any person pirating a copyright work is liable to a special action, and all copies of pirated works become the property of the proprietor of the copyright. The provisions of this act extend to musical compositions, and also to the liberty of representing dramatic pieces and musical compositions. By 5 and 6 William IV. cap. lxv. the right of printing and publishing lectures belongs to the lecturer.

The present law of the United States of America gives the author the privilege of exclusive publication for twenty-eight years, and of a renewal of fourteen years more to his wife or children, but not to a third party who may be in possession of the copyright. In France and Belgium the law of copyright gives to authors a right in their works for life, and to their heirs for twenty years after. In Germany the copyright belongs to an author during his whole life, and to his heirs for thirty years after.

A copyright may exist in a translation, or in part of a work (as in notes or additional matter), with an exclusive right to the whole; but a *bona fide* abridgment of a book is not considered, in Britain and America, a violation of the original copyright. So a person may use fair quotation, if by its application he makes it a part of his own work; but cannot take the whole, or a large part of a work, under the pretence of quotation. If an encyclopædia or review copies so much of a book as to serve as a substitute for it, it becomes liable to an action for a violation of property.

The sums which have been paid for copyrights have varied with the nature of the work, the reputation of the author, and the liberality of the publisher. An original work, the author of which is unknown, and the success of which must depend on the taste and talents of the writer, and the taste and wants of the age, will stand little chance; while a book suited to the market, for which the publisher can calculate the demand, may command a liberal price. A compilation or a dictionary may succeed, where the poems of a Milton, the philosophy of a Hume, or the histories of a Robertson could find no encouragement.

Copyright in designs for manufactures was established by an act passed in 1787 (27 Geo. III. cap. xxxviii.), and extended and regulated by subsequent acts, the last relating to it being passed in 1861 (24 and 25 Vict. cap. lxxiii.) Copyright in engravings was established by an act passed in 1735 (8 Geo. II. cap. xiii.); and the law regarding this species of copyright was amended in 1852 (15 and 16 Vict. cap. xii.) Copyright in paintings, drawings, and photographs was established by act 25 and 26 Vict. cap. lxviii. (1862), and finally copyright in sculpture was established in 1798 by act 38 Geo. III. cap. lxxi., which has since been several times extended and modified.

COPYRIGHT, International. By act 1 and 2 Vict. cap. lix. (31st July, 1838), the copyright of works published in foreign countries is secured to the authors and their assigns within the British dominions, on complying with certain regulations. The benefit of this act is restricted to works published in foreign countries, where a similar protection is accorded to those published in Great Britain. France, Prussia, Saxony, and other German powers, and also Sardinia, have concurred at different times in this system of reciprocal copyright; but all attempts to establish it between Britain and the United States have as yet failed. One of the most important international copyright treaties is that concluded between France and Belgium on the 22d of August, 1852, by which the piratical publication of French works in Belgium was put an end to.

COQUIMBO, a province in Chili, with a capital of the same name, bounded N. by province Atacama, E. the Andes, S. the river Choapa, and W. the Pacific. It occupies the entire breadth of Chili, from the Andes to the Pacific, and is generally about 100 miles broad. It is very mountainous; but there is only one volcano, that of Limari, within its limits. It has numerous mines of copper; and contains also gold, silver, quicksilver, and lead. The copper mines are abundant and extensively wrought, forming now the staple mineral of the province, and of which very large quantities are exported. The province is not fertile in grain, not producing enough for its own consumption; but fruit is abundant, especially figs and grapes. Pop. in 1870, 159,698.

COQUIMBO, or La Serena, capital of the above province, about a quarter of a league from the sea, on a river of the same name, 10 miles S.W. of Rioja. The population numbers 16,000, and consists of Spaniards and people of colour, with some Indians. The harbour is accounted one of the best on the west coast of South America, and is much frequented. It is the see of a bishop, and has several churches and convents. The streets are built in a line from north to south, and east to west; well watered, and shaded with fig-trees, palms, oranges, olives, &c., always green. It was founded in 1542 or 1543 by Juan Bohun at the command of Valdivia, and after being destroyed by Indians, was rebuilt in 1549 by Francisco de Aguirre, who gave it the name of La Serena, in honour of his native place of the same name in Estremadura.

CORACLE, an ancient British truckle or boat, constructed of wicker-work, and still in use amongst Welsh fishermen and on the Irish lakes. It is covered by skins, oil-cloth, &c., which are removed when out of use. It is of an oval form, and contains one man, who on reaching the shore shoulders his coracle, deposits it in a place of safety, and covers it with dried rushes or heather. The Arctic *baidar* is of a similar construction. It is probably of the like primitive fabric with the *cymba sutiles* of Herodotus.

CORAL (Greek, *korallium*), the name applied to the calcareous stony structures secreted by many of the *Actinozoa*, which form one of the divisions of the cœlenterate zoophytes, and also applied to the animals themselves. Two kinds of corals are distinguished by naturalists, those in which the calcareous skeleton is developed in the walls of the body, as in the reef-building corals, and those in which (as in the red coral of commerce) the skeleton is external or cuticular. Reproduction takes place by ova, but chiefly by budding, the new individual remaining in organic union. In all, the radial partitions referred to under Cœlenterata exist, and are represented by corresponding skeletal structures; the number of these rays being of importance in classification. The coral masses grow not merely by the multiplication of individuals, but by the increase in height of each of the latter, which, as they grow, become divided transversely by partitions. The animal, distended with eggs, collapses on their discharge, and thus becomes too small for the cup which it formerly occupied; it cuts off the waste space by the horizontal layer, and the repetition of this process gradually adds to the height of the mass. It is in this way that the coral reefs and islands, occurring in such abundance in the Pacific, the Indian Ocean, and the Red Sea, are built up—works of such stupendous and astonishing bulk when compared with the tiny architects by which they are constructed.

These coral reefs appear under three principal types, namely, the *fringing* reef, the *barrier* reef, and *atoll* or *lagoon* reef. Mr. Darwin's theory of their formation, now generally accepted by naturalists, is

briefly as follows. In the first place, the coral-producing polypes cannot exist at a greater depth than between 20 and 30 fathoms from the surface; and in the second place, there is ample evidence that an immense area in the Pacific has for ages been in a state of oscillation, the earth gradually sinking or rising. Now from the fact of the polypes being unable to live at greater depths than those stated, it is inferred that wherever a lagoon island or atoll exists, the polypes must have wrought upon a foundation or platform at 20 or 30 fathoms at most from the surface. This foundation is obtained by the subsidence of the land. Take for illustration a peaked volcanic island in the South Seas, 6000 feet high, and fringed at the sea-margin with a coral reef, the work of corals living near the shore. This island is supposed gradually to subside into the sea, but so slowly as to allow the polypes to add meanwhile to the height of the reef, which in these circumstances will continue to present a surface for their operations at the same uniform depth. Suppose, further, the island to be conical, and its diameter 20 miles at the base, and 10 miles half-way to the summit; when its original height of 6000 feet is diminished by one-half, the coral formation will be no longer a fringing reef, but will stand far out at sea, with 5 miles of water on all sides betwixt it and the island. It is now a barrier reef, such as the great barrier reef that extends along the eastern side of Australia. (See BARRIER REEF.) But should the island continue to sink till it disappear altogether, and if the conditions have been maintained for enabling the coral polypes to exist at their wonted level, and carry on their upward operations, the reef will then be left as a huge circle inclosing water, and constituting an atoll or lagoon island 20 miles in diameter, that being the extent of the original fringing reef, which has been rising in height, while the shore on which it is founded has sunk to a depth equal to the former elevation of the land above the sea. The coral formation is thus raised to a height just below the surface of the sea at low-water, and it is elevated still more by fragments of its own substance and by various ocean strays piled up on it by the waves. The atoll in this way rises above the surface of the sea, is in due time taken possession of by a tropical vegetation, and at length becomes the habitation of man. The instinct of the polype is in no sense employed in building the coral reef, as is that of the bee in constructing its cells; it belongs to a class of zoophytes having the property of secreting lime from the ocean, and consolidating it amongst the feeble tissues of their own bodies; and the stupendous wall of coral is the result simply of successive generations of polypes having lived and died, and left their calcareous remains upon a platform which had been provided for them by the imperceptible but gradual submergence of the land. —(Darwin's Voyage of the Beagle; Dana on Zoophytes.)

The coral of commerce and the arts is the production of various polypes, and is of different colours and internal structure. The red, pink, and black sorts are the most highly prized. The red coral has a branching shrub-like form, and, as well as other sorts, is found abundantly in the Mediterranean. The coral fishery, as it is called, is carried on in various parts of the Mediterranean, the principal localities being the south-west coast of Corsica, where the finest quality is found, the coast of South Italy, and the north coast of Africa (Algeria and Tunis). The raw coral is wrought chiefly in Leghorn, Genoa, and Naples, whence it is sent in the form of beads and other articles of ornament to the East Indies, Germany, Russia, &c. The value of the coral brought yearly to Genoa is said to amount to nearly £500,000. The coral is brought up from the bottom by means of net-work bags with wide meshes, attached to cross-beams of wood that are let down from a vessel by a line. This apparatus is dragged along the bottom by the motion of the vessel, and when pieces of coral and rock are entangled in the lines, the whole is drawn up by a capstan. The vessels engaged in this pursuit range from 6 to 15 tons, and carry a great lateen sail.

Coral is capable of taking a good polish, but is not susceptible of receiving the finer execution of a gem as the hard and precious stones. Caylus has published an antique head of Medusa, sculptured in coral, of which the eyes are composed of a white substance resembling shells. He supposes it to have been an amulet, because the ancients, who were partial to a mystical analogy between the substance and the subject represented, supposed, as Ovid relates in his Metamorphoses, that Perseus, after having cut off the head of Medusa, concealed it under some plants of coral, which instantly became petrified, and tinged with the colour of the blood which flowed from it, and from a green turned to a red colour. Pliny and other ancient authors attribute many superstitious qualities to the coral; therefore it is no wonder that it was often taken for an amulet. Pliny also relates that the Gauls, and the people inhabiting maritime parts of Italy, as well as other nations on the sea-coast, used it to form ornaments for their armour and household furniture.

In composition coral consists chiefly of carbonate of calcium, with variable quantities of other salts of calcium and magnesium, and some organic matter. The red colouring matter in some kinds is said to be not of mineral but of organic origin.

CORALLINE, or PÆONINE, an orange red colour, prepared by the action of ammonia at about 300° Fahr. upon rosolic acid, or upon the washed residue of the action of a mixture of sulphuric, oxalic, and carbolic acids. It differs from magenta both in its tint and its permanency, not being affected by light or by alkalies; but, on the other hand, fabrics dyed with it are readily turned yellow by acids. It is insoluble in water, but dissolves in alcohol with a very rich colour. This solution, mixed with soda and a large quantity of water, and tartaric acid added, is employed for dyeing silk. It is also printed upon cotton by means of albumen. The use of this dye has been much restricted on account of its alleged poisonous properties. Certain toxicologists had observed that stockings coloured with coralline produced a vesicular eruption, which gradually became purulent, and which was attended with febrile and other symptoms. When the dye was dissolved out and administered to small animals it proved fatal to them. Other chemists, however, failed to get this action with coralline, so that it is likely that in some cases deleterious substances are mixed with coralline, or that coralline may differ if prepared in different ways, or that different substances pass under the name.

CORBAN (from the Hebrew *karab*, to approach). In the Scriptures this word signifies an offering to the Lord. Our Saviour refers to the use of this word in Mark vii. 11.

CORBEL, in architecture, a piece of stone, wood, or iron projecting from the vertical face of a wall, to support some superincumbent object. Corbels are of a great variety of forms, and are ornamented in many ways. They are of frequent occurrence in pointed architecture, forming the supports of the beams of floors and of roofs, the machicolations of a fortress, the labels of doors and windows, &c.

CORBIE STEPS, steps into which the sides of gables from the eaves to the apex are broken. They are common in Scotch architecture, into which they

were probably introduced from France. They are also to be seen in many old houses in Holland, Flanders, &c.

CORCHORUS, a genus of plants belonging to the natural order *Tiliaceæ*. The name comes from the Greek *korchoros*, a derivative of the verb *koreō*, to cleanse or purge, and was given to it on account of the laxative properties of one of the species. The characters of this genus are:—a deciduous calyx with five sepals, a corolla of five petals, stamens indefinite; stigmata sessile, two to five in number; fruit a capsule in the form of a pod, sometimes globular, with from two to six cells opening by as many valves. The genus includes several species, all of which are exotic. The best known is the *Corchorus olitorius*, also called Jews' mallow, from the name of *Olus Judaicum*, which was given to it by the botanists of the Middle Ages, because the Jews were the first to use it. It is an annual plant, smooth, with dentate leaves, and flowers of an orange yellow colour. It is a native of India. In Syria it is cultivated for food, and is used in the preparation of certain soups. The *Corchorus capsularis* is also a native of India, and the fibres of both this and the former species form a large proportion of the jute that is imported into Europe from that country. This species is also extensively cultivated in China, and is hence sometimes called Chinese hemp. The *Corchorus hirsutus* is a hairy shrub, a native of South America.

CORDAY D'ARMONT, MARIE ANNE CHARLOTTE, the murderess of Marat, was born at Saint Saturnin, near Séez, in Normandy, on the 27th of July, 1768. The true form of her name is Armont as here written, not Armans as it is frequently spelled, which was proved by the publication of her baptismal certificate on the 1st of Oct., 1864. With the charms of her sex she united a rare courage. Her lover, an officer in the garrison of Caen, was accused by Marat as a conspirator against the republic, and assassinated by villains hired for that purpose. This excited Charlotte Corday to revenge. History had inspired her with a deep-rooted hatred against all oppressors, and she determined to free her country from Marat, whom she considered as the head of those monsters called *buveurs de sang* (drinkers of blood). Another motive confirmed her purpose. Many deputies, such as Barbaroux, Louvet, Gaudet, and others, who were persecuted by Marat, and afterwards proscribed, May 31, 1793, to whose opinions she had attached herself, invoked the assistance of Frenchmen in behalf of liberty, now expiring beneath the horrors of the times. Charlotte then left home, entered Paris July 11, 1793, and went twice to Marat's house, but was not admitted. On the same evening she wrote to him as follows:—'Citizen, I have just now come from Caen. Your love for your country no doubt makes you desirous of being informed of the unhappy transactions in that part of the republic. Grant me an interview for a moment, I have important discoveries to make to you.' The following day came, and, with a dagger in her bosom, she proceeded to the house of Marat, who, just on the point of coming out of his bath, immediately gave orders that she should be admitted. The assemblies at Calvados were the first subjects of conversation, and Marat heard with eagerness the names of those who were present at them. 'All these,' he exclaimed, 'shall be guillotined.' At these words Charlotte plunged her dagger into his bosom, and he called out '*A moi! mon ami!*' when some attendants rushed in and seized Corday, who remained calm and tranquil as the priestess before the altar, in the midst of the tumult and confusion. She was afterwards conducted as a prisoner to the *Abbaye*. A young man who begged to die in her place was also condemned to death. Her first care was to implore the forgiveness of her father for disposing of her life without his knowledge. She then wrote to Barbaroux as follows:—'To-morrow at five o'clock my trial begins, and on the same day I hope to meet with Brutus and the other patriots in Elysium.' She appeared before the revolutionary tribunal with a dignified air, and her replies were firm and noble. She spoke of her deed as a duty which she owed her country. Her defender (Chaveau-Lagarde), full of astonishment at such courage, cried out, 'You hear the accused herself! She confesses her crime; she admits that she has coolly reflected upon it; she conceals no circumstance of it; and she wishes for no defence. This unshaken calmness, this total abandonment of herself, these appearances of the utmost internal tranquillity, are not natural! Such appearances are to be explained only by political fanaticism, which armed her hand with the dagger. To you then, gentlemen of the jury, it belongs to judge of what weight this moral view may be in the scale of justice!' His words could make no impression on the minds of the judges. After her condemnation she thanked her defender with these words: 'I would willingly give you some token of the esteem with which you have inspired me. These gentlemen, however, have just informed me that my property is forfeited; but I have incurred some small debts during my imprisonment, and I hereby transfer the obligation to you.' She was conducted to the scaffold in a red mantle, and passed with a smiling countenance through the crowd, by whom she was pursued by shouts of execration. She retained her presence of mind to the last. A voice from the multitude exclaimed, 'She is greater than Brutus!' It was Adam Lux, a deputy from the city of Mentz, who, fired with admiration, wrote to the tribunal, requesting to die like Charlotte Corday. She was guillotined July 17, 1793. This incident has afforded subjects for a considerable number of dramas, paintings, &c., especially in France; the most trustworthy account of her life is to be found in the work entitled Charlotte de Corday, by L. Dubois (Paris, 1838).

CORDELIERS. This word originally signified an order of Franciscan monks; it was afterwards the name given to a society of Jacobins, from 1792 to 1794, who were so called from their place of meeting. These were distinguished by the violence of their speeches and conduct. In this club of the Cordeliers Marat and André soon began to raise their voices. The talents of Danton also procured it some reputation; and Camille-Desmoulins published a journal under the name of The Old Cordeliers, in which he at last took the field against the ultra-revolutionists, and endeavoured to unmask the notorious Hébert and his associates. But when he was afterwards imprisoned and executed with Danton, the society sank and, even before the abolition of the Jacobin Clubs, fell into total oblivion. See CLUB.

CORDILLERAS. See ANDES and MEXICO.

CORDON, in a military sense, troops so disposed as to preserve an uninterrupted line of communication, to prevent a country either from hostile invasion or from contagious diseases. In the latter sense it is called a *Cordon sanitaire*.—In the science of fortification cordon signifies a row of stones jutting out in front of the rampart at the base of the parapet. It serves as an ornament.

CORDOVA, on the Guadalquivir, an ancient and celebrated town in Lower Andalusia, capital of a province of the same name, which was formerly a small Moorish kingdom. It is built on a gentle declivity of a chain of mountains, forms an oblong quadrangle, and is surrounded with walls and lofty towers. A part of the town is of Roman, a part of Moorish origin; many of the buildings are in ruins,

and a number of gardens occupy a great part of the inhabited space. The streets are narrow, crooked, and dirty; the *plaza mayor*, the principal market-place, however, is distinguished for its size, its regularity, and the beauty of the colonnade by which it is surrounded. The remains of the residence of the Moorish kings now form a part of the archbishop's palace. The cathedral is a splendid building, originally a mosque, erected in the eighth century by King Abderahman, strikingly ornamented with rows of cupolas, partly octagonal and partly round, which are supported by 850 pillars of jasper and marble, forming nineteen colonnades. The bridge over the river rests on sixteen arches. Cordova has always carried on considerable trade; and even under the Moors the leather exclusively manufactured there (cordovan) was exported in all directions. At what period the Romans laid the foundation of the town (*Colonia Patricia*, afterwards *Corduba*) is not known. In 572 it was conquered by the Goths. During the reign of the dynasty of the Ommiades it was the capital of Arabian Spain; and afterwards, when Abderahman threw off his allegiance to the eastern caliphs, it became the residence of the powerful caliphs of the West, the sacred city of the Moors, and the centre of Arabian splendour and science. At that time the city is said to have been about 15 miles in circuit, and to have possessed a pop. of 1,000,000. In 1236 it was taken by Ferdinand III. of Castile; in 1808 it was pillaged by the French, who captured it again under Soult in 1810. The present pop. is 35,606, or, including the suburbs, 43,000.—The province of Cordova includes the fertile and beautiful valley of the Guadalquivir and the mountains of Sierra Morena, a part of which are constantly covered with snow. The area of the province is 5,188 square miles, and the pop. in 1867 was 379,464.

CORDOVA, a province of La Plata, after that of Buenos Ayres the most important of the Union, is bounded N. by Santiago del Estero, E. by Santa Fe, S. by the Pampas, and W. by provinces Rioja, San Juan, and San Luis. It is crossed by several chains of mountains, and watered by several rivers. The principal town is called by the same name, besides which there are some towns and villages. The inhabitants feed a great number of cattle and horses, which form their principal trade. Serpents are numerous: some of them are of an amazing size and exceedingly dangerous; others are harmless. Pop. in 1869, 210,508.

CORDOVA, a town of La Plata, and capital of the province of same name, 450 miles by the common road N.N.W. Buenos Ayres; pop. about 25,000. It is the see of a bishop. It occupies a beautiful and well-sheltered site in the valley of the Primero, and has a handsome cathedral and a spacious market-place. The college, formerly belonging to the Jesuits, is a large edifice, now appropriated to public purposes. The adjacent country is fruitful, abounding in excellent pasture.

CORDOVAN, a fine leather which took its name from the city of Cordova, where it was manufactured in large quantities. Much is now made in the Barbary States. It is also called cordwain.

COREA, a kingdom of Asia, consisting chiefly of a peninsula in the north-east of China, bounded N. by Chinese Tartary, E. by the Sea of Japan, S. by a narrow sea which parts it from the Japanese Islands, and W. by the Yellow Sea, which parts it from China; about 600 miles from north to south, and 135 from east to west; between lat. 33° and 43° N., and lon. 124° and 130° E. It is called by the natives Tsio-tsien; by the Chinese, to whom it is tributary, Kao-li; and by the Japanese Korai, whence its European name. Pop. vaguely estimated at about 9,000,000 or more; square miles, about 80,000. Kingki-tao or Hang-yang-ching is the capital.

The peninsula is traversed through its length by a cordillera, abrupt and precipitous on the east, but forming a gentle slope on the west side, which, being watered by the principal rivers of the country, is exceedingly fertile. In the north the only grain that can be grown is barley; but in the south the soil is fertile, and wheat, cotton, rice, millet, indifferent legumes, and hemp, are grown extensively. The rice is inferior to that of Japan, but cultivated with much assiduity, and under considerable disadvantages from the hilly nature of the country. A decoction of pinang, a kind of walnut, is substituted for tea. The ginseng root is a production of Corea, greatly valued in China and Japan, where high prices are given for it. The domestic animals are oxen, pigs, goats, dogs, and cats, and a small race of horses, very strong and spirited, called mon-k-wat. Oxen only are used for agricultural labours, the horse being reserved expressly for the saddle. Stags, hares, foxes, wolves, and sables are abundant; and the skins of the sables form a prominent article of tribute. The royal tiger and panther are so numerous that their skins form an article of commerce with foreigners. The manufactures of Corea are, generally speaking, coarse. They comprise tissues of hemp, cotton, and grass, strong but coarse; silk in considerable quantity, but not very fine; pottery and porcelain, sometimes of monstrous size; excellent arms —Corean sabres and poignards being much sought for by the Chinese; and well-made matchlocks. Paper is an important article of manufacture, entering, as it does in Corea, into the construction of numerous articles. Corea is governed by a king, whose sway is in a manner absolute, and, though tributary to China, his freedom of action seems quite uncontrolled. The governmental constitution of the crown is organized like that of China. The prevailing religion is Buddhism, although there appears to be another religion in existence in the country, like the Sin-too in Japan and the Tao-syn in China. Confucius also is much esteemed in Corea, and has many followers. Christianity, which had been introduced through Japan, is now extinct. Corea was first subjugated by the Tartars, but afterwards the Chinese gained possession of the country. The Japanese conquered and held it between the years 1692 and 1698, when it again fell under the sway of China, and still pays a small annual tribute of 800 oz. of silver to the emperor, to whom also an embassy is sent every year with presents, and to communicate information of any political event of importance that may have occurred.

CORELLI, Arcangelo, a celebrated performer on the violin, was born at Fusignano, in the territory of Bologna, in the year 1653, and was instructed in church music by Matteo Simonelli, a singer at St. Peter's in Rome, and in profane music by Bassano of Bologna. In the year 1680 he travelled into Germany, and was in the service of the Elector of Bavaria during five years, after which he returned into his own country. He performed on the violin with great judgment and an incredible degree of accuracy. His execution was peculiarly characteristic, full of spirit and expression, and his tone was firm and uniform. Cardinal Ottoboni was his patron at Rome. Corelli formed and conducted, according to the original plan of Crescentini, the celebrated musical academy which met at the palace of the cardinal every Monday. By his sonatas on the violin, and by his concerts, he may be considered, as it were, the creator of a new species of harmony, especially for his own instrument. He died in 1713,

and, besides a considerable fortune, left behind him a valuable collection of paintings, which became the property of Cardinal Ottoboni. He was buried in the Pantheon.

CORFE CASTLE, a castle in Dorsetshire, now in ruins, standing a little north of a small town, to which it gives its name, and with which it is connected by a bridge of four arches. It was built by King Edgar, and at its gate his son Edward the Martyr was murdered in 979. It was the occasional residence of King John, and was for some time the prison of Edward II. During the great civil war it was heroically defended against the Parliamentarian forces by Lady Bankes. It was subsequently taken by Fairfax through the treachery of an officer of the garrison, when it was demolished, 1646.

CORFU, or KERKYRA (anciently *Drepanē*, then *Corcyra*, and by the natives identified with the Homeric *Scheria*), an island in the Mediterranean at the mouth of the Adriatic, near the coast of Albania, about 40 miles long, and from 15 to 20 wide; pop. (1870), 96,940; square miles, 427. The climate is mild but variable, the air healthy, the land fertile, and the fruit excellent. Oranges, citrons, the most delicious grapes, honey, wax, and oil, are exceedingly abundant. Some parts are mountainous and barren, and good water is scarce. Salt forms a great part of its riches. The capital has always borne the name of the island. The ancient Corcyra was a Corinthian colony founded by Chersicrates in the eighth century B.C. It was subjugated for Athens by Timotheos, B.C. 375, and after being in the possession of various powers, fell to the Romans in 229 B.C. Towards the end of the fourteenth century it came into the power of the Venetians. It was afterwards taken by the French, and ceded to them by the treaty of Campo-Formio in 1797. In March, 1799, it was taken from them by the Russians and Turks, and united with Cephalonia, Zante, &c., to form a republic, under the denomination of the *Seven Islands;* and, with the rest of the Ionian Islands, it was annexed to the Kingdom of Greece in 1864.

CORFU (anciently *Corcyra*), capital of the island of the same name; pop. in 1871, 15,452. It is the residence of an archbishop of the Greek Latin Church. It has a good harbour and considerable trade. In 1818 a university was established here under the auspices of the British government, by the Earl of Guilford, who was appointed chancellor, and nominated Greeks of the first abilities to the different chairs. Corfu was formerly defended by two forts besides the citadel, but the fortifications were dismantled when the Ionian Islands were transferred to Greece in 1864.

CORIANDER (*Coriandrum sativum*, Linn.), an umbelliferous plant, native of Italy, and cultivated in other parts of Europe. The whole plant has an unpleasant smell, but the seed is very agreeable and aromatic when dry. It acts in the same manner as aniseed, &c., and enters into several officinal compounds. When the bruised seeds are distilled with water a volatile oil comes over, which is yellowish, has an aromatic smell and taste, and is soluble in alcohol and ether. It consists of several oils, which are not always present in the same proportions. The medicinal use of the seeds depends upon this oil.

CORIGLIANO, a town, Naples, in the province of Cosenza, on a hill above the right bank of the Corigliano, 24 miles N.E. of Cosenza, with 10,547 inhabitants. It stands near the site of the ancient Sybaris, of which no vestiges remain; and is poorly built, consisting of narrow, crooked streets. It is defended by a citadel, and has some trade in the wine, oil, and fruits produced in the district.

CORILLA. See IMPROVVISATORI.

CORINGA (*Caranga*), a considerable sea-port in Hindustan, in the province of North Circars, 38 miles S.E. Rajamundry, near the mouth of the Godavery. With the exception of Blackwood's Harbour, Coringa Bay is the only smooth water during the south-west monsoon on west side of the Bay of Bengal, and it possesses the only wet dock on the continent between Calcutta and Bombay. A great number of small vessels are annually built here. Cotton stuffs and teak are exported; and silk, paper, copper, &c., imported. In 1784 an inundation of the sea destroyed many lives and much property.

CORINNA, called the *lyric muse*, a poetess of Tanagra, in Bœotia, contemporary with Pindar, whom she is said to have conquered five times at musical contests, and therefore her image, crowned with the chaplet of victory, was placed in the gymnasium of Tanagra. According to Pausanias, who relates this fact, she was so beautiful that her charms may have influenced in some degree the opinion of the judges. It is probably owing to the tenderness and softness of her songs that she received the surname of the *fly*. Sappho and Erinna were each called the *bee*. Of the numerous poems which the ancients ascribed to her, only a few fragments have come down to us. They have been collected by Bergk in his Lyrici Poetæ Græci (Leipzig, third edition, 1865), and by Schneidewin in his Delectus Poetarum Græcorum (Gött. 1839). Madame de Stael has given the name of *Corinne* to the heroine of one of her novels.

CORINTH, a celebrated city upon the isthmus of the same name, which unites the Morea with Livadia. It was once renowned among the cities of Greece, commanded by its advantageous position a most important transit trade, and possessed all the splendour which wealth and luxury could create. Only a few ruins remain to attest its ancient magnificence; but much might undoubtedly be obtained by excavation. Capitals and bass-reliefs are found in great numbers in the houses of the bey and other Turks formerly residing here; the latter, however, are put to the use of ordinary pieces of marble, having the figured side turned inwards. The western harbour, Lechæum, on the Gulf of Corinth, is choked with sand, as is likewise the eastern harbour, Kekhries (ancient *Cenchreæ*), on the Saronic Gulf. Of the shallow harbour Schœnos, on the north of the city, where was a quay in ancient times, there hardly remains a trace. All these harbours are now morasses, and corrupt the air of the city. The mosques and churches, and the palaces formerly belonging to Turks of high rank, are built partly out of the ruins of the ancient city. The Turks did nothing for the city or the harbours; they only paid a little attention to the Acrocorinthus.

Corinth derived in ancient times great advantages from its situation on the isthmus, between two bays, belonging to what may be called two different seas, if we consider the poor state of navigation in ancient times; and a great exchange of Asiatic and Italian goods took place there. The duty paid on these goods afforded a great revenue to the state; and the citizens accumulated such wealth, that Corinth became one of the most magnificent, but at the same time most voluptuous cities of Greece. Venus (Aphrodite) was the goddess of the city, and courtezans were her priestesses, to whom recourse was often had, that they might implore the protection of the goddess in times of public danger; and a certain number of new priestesses were consecrated to her at the commencement of important enterprises. Lais and several other females of the same profession were distinguished by their great accomplishments and beauty, and the high price which they set on their charms; hence the old proverb, *Non cuivis homini contingit adire Corinthum*, that is, 'It isn't everyone that can

afford to go to Corinth.' The virtuous women celebrated a feast to Venus apart from the others.

The famous Sisyphus was the founder of the Æolian dynasty, which is uniformly represented as the first that ruled in Corinth. His family was succeeded by the Heraclides (who were dethroned after several centuries), and the government intrusted to 200 citizens, called *Bacchiades*. Heeren thinks that they were, at least several of them, merchants. To this oligarchy followed a monarchical form of government, which was succeeded by a constitution approaching nearer to oligarchy than to democracy. In the sequel Corinth became the head of the Achæan League, and was conquered and destroyed by the consul Mummius, 146 B.C. Julius Cæsar, about a hundred years later, rebuilt it; but its commerce could not be restored; the productions of the East now took the road to Rome. St. Paul lived here a year and a half. The Venetians received the place from a Greek emperor; Mohammed II. took it from them in 1458; the Venetians recovered it in 1687, and fortified the Acrocorinthus again; but the Turks, under Ali Comourgi, celebrated in Byron's Siege of Corinth, took it anew in 1715, and retained it until the revolution of the Greeks, during which it was the seat of the *soi-disant* Greek government. Against any enemy invading the Morea from the north Corinth is of the highest military importance. It is described at some length in Dr. Wordsworth's Greece: Pictorial, Descriptive, and Historical.

The situation of Corinth is one of the most charming that can be imagined, surrounded as it is by the beauties of nature and the charms of poetic and historical associations. The Acrocorinthus, on its picturesque and beautiful cone, seems like an observatory for surveying the whole field of Grecian glory. The waters of two bays wash the olive groves which border the city; and from every hill in it you can survey the noble Helicon and Parnassus, or let your eye wander over the isthmus, where, in happier ages, the Isthmian games were celebrated, even to the mountains and shores of Megara and Attica. Nero began to dig a canal through the isthmus, but his successors were ashamed to complete a work which had been undertaken by such a monster, though it happened to be a good one. The luxury of ancient Corinth was greater than that of any other place in Greece. At the court of the Byzantine emperors there were officers called *Corinthiarii*, who were keepers of the ornaments and furniture of the palace. Pop. about 15,000. For farther information on the ancient political history of Corinth see TIMOLEON.

A certain mixture of various metals was called *Corinthian brass*, and was very dear. The story that it had its origin in the accidental melting together of different metals at the time of the conflagration of Corinth, when taken by Mummius, is a fable, the brass having been in use long before.

CORINTHIAN ORDER. See ARCHITECTURE.

CORIOLANUS, the name given to an ancient Roman, Caius, or more properly Cneius, Marcius, because the city of Corioli, the capital of the kingdom of the Volsci, was taken almost solely by his exertions. His valour in the victory over the Antiates was rewarded by the consul Cominius with a golden chain. Coriolanus, however, lost his popularity when, during the famine which prevailed in Rome 490 B.C., he placed himself at the head of the patricians in order to deprive the plebeians of their hard-earned privileges, and even made the proposition to distribute the provisions obtained from Sicily among them only on condition that they would agree that the tribuneship should be abolished. Enraged at this, the tribunes commanded him to be brought before them; and when he did not appear they endeavoured to seize his person, and failing in this attempt condemned him to be thrown from the Tarpeian rock. But the patricians rescued him; and it was finally determined that his cause should be brought before the tribunal of the whole people. Coriolanus appeared, and made answer to the complaints alleged against him by the tribunes (who accused him of tyranny, and of endeavouring to introduce a regal government), by the simple narration of his exploits, and his services towards his country. He showed the scars on his breast, and the whole multitude were affected even to tears. But notwithstanding all this he was unable to repel the accusations against him, particularly that of distributing the spoils of war among the soldiers instead of delivering them to the quæstors, as the laws of Rome required; and the tribunes were enabled to procure his banishment.

Coriolanus now resolved to revenge himself upon his country, and immediately went to the Volsci, the bitterest enemies of Rome, and prevailed upon them to go to war with her before the expiration of the truce. He himself was joined with Attius Tullius in the command of their army, which immediately made itself master of the cities of Latium. The Volscian camp was pitched in sight of Rome before troops could be raised for the defence of the city. The envoys sent by the senate returned with the answer, that Rome could purchase peace only by the surrender of the territory taken from the Volsci. A second embassy was of no more avail; and at length, the priests and augurs having returned equally unsuccessful, the terror of the inhabitants was extreme. Valeria, the sister of Valerius Publicola, exhorted the women to try the effect of their tears on the resolution of Coriolanus. She immediately went to the house of Veturia, his mother, whom he highly honoured, where she also found Volumnia, his wife, and besought both to go with the other women to make a last experiment upon the heart of the conqueror. The senate approved of this resolution, and the Roman matrons, Veturia and Volumnia with her children taking the lead, went towards the camp of Coriolanus, who, recognizing his mother, his wife, and his children, ordered the lictors to lower their *fasces*, and received them with tender embraces. He then urged them to leave the treacherous city, and to come to him. During this time his mother never ceased entreating him to grant his country an honourable peace, and assured him that he never should enter the gates of Rome without passing over her dead body. At length, yielding to her entreaties, he raised her from the ground, and confessed that she had prevailed. He then withdrew his army from before Rome, but as he was attempting to justify himself in an assembly of the Volsci was assassinated in a tumult excited by Attius. The Roman senate caused a temple to be built to Fortuna Muliebris (female fortune) upon the place where Veturia had softened the anger of her son, and made her the first priestess. The story of Coriolanus is now regarded as legendary. It forms the subject of one of Shakspeare's plays.

CORK, a maritime county, Ireland, province of Munster, having St. George's Channel S., county Limerick N., Kerry W., Waterford and Tipperary E. Extreme length, E. to W., 110 miles; extreme breadth, 70 miles; area, 2885 square miles, or 1,846,333 acres, of which 1,308,882 are arable, 465,889 uncultivated, and 52,180 in plantations. The west part of the county is mountainous, the north and east extremely fertile; in the latter part, lying north of the Blackwater, is a rich, level tract of country, upwards of 20 miles in length, E. to W., and from 5 to 9 miles

in breadth. The coast is indented with numerous bays and inlets, of which the more important are Bantry, Dunmanus, Long Island Bay, Clonakilty, Kinsale, and Cork harbour; and serrated with headlands and promontories. Off the coast lie the islands of Cape Clear, Whiddy, and several smaller ones. The climate is remarkably mild, though moist, and is without the extremes of heat and cold experienced in the same latitude in England. The county is watered by the Bandon, Lee, and Blackwater, and numerous smaller streams. The soils vary considerably; but, excepting on the estates of resident gentlemen, agriculture is not generally in a very advanced state. The principal crop is potatoes; but oats are also grown extensively, and wheat in considerable quantities. The cattle in the south and south-west are small, but yield abundance of milk. In the northern parts of the county they are of superior size and form. Cattle, sheep, and pigs are exported to a great extent, and the trade has recently much increased. There are extensive dairies in various parts of the county, especially in the vicinity of Cork city; and great quantities of butter are exported. The mineral productions are chiefly iron (not wrought since the timber of the county was exhausted), copper, manganese, coal, limestone, fullers' earth, and brick clay. In the copper mines at Allahies—the most important in Ireland, and situate at the south extremity of the mountainous peninsula between Kenmare River and Bantry Bay—from 1500 to 2000 hands are employed. The fisheries are important. The chief fishery districts are Youghal, Queenstown, Kinsale, Skibbereen, Bantry, and Castleton. The county returns eight members to Parliament; two for the county, two for Cork city, and one for each of the boroughs of Youghal, Bandon, Mallow, and Kinsale. Pop. in 1871, 437,664; or including the city of Cork, 516,046.

CORK, a city of Ireland, capital of the county of Cork, situated about 138 miles S.W. Dublin. It was originally built on an island formed by the river Lee, but is now greatly extended on the opposite banks of both branches of the river. It is 15 miles from the sea, and its harbour or cove, 11 miles below the town, is celebrated for its safety and capaciousness. Its entrance, deep and narrow, is defended by a strong fort on each side, and also strong fortifications on two islands, called Spike and Haulbowlin, whose guns command the entrance. There is also an upper harbour nearer the city, and quays extending over 4 miles in length. The river has been greatly improved and deepened in recent years, at a cost of £300,000, and vessels of 600 tons can come up to the town.

Cork is the third city in Ireland, and exports great quantities of grain, butter, provisions, and live-stock. Bacon and hams are cured in large quantities for exportation. The trade between Bristol and Cork is considerable, and whisky and porter are exported in large quantities. The number of vessels entered in 1871 was 372, of 137,298 tons burden; the number that cleared was 95, of 23,034 tons, exclusive of those in the coasting trade, in which 2106 entered, and 1436 cleared. Sailcloth, coarse sheeting, coarse woollen, paper, leather, and superior glass, are manufactured here; but the principal manufactures are tanning, distilling, brewing, gloves, ginghams, and friezes. There are also iron-foundries, and yards for the building of iron ships. There are nine bridges over the river and its branches, two of which, both very elegant, were finished in 1861 and 1864. Near the city is a cemetery on the plan of Père La Chaise, and a public park of 240 acres on the south bank of the river.

The principal buildings are a cathedral, exchange, commercial buildings, custom-house, chamber of commerce, courthouse, queen's college, opened in 1849; penitentiary, house of correction, theatres, several hospitals and churches, infantry and cavalry barracks affording accommodation for 2000 men, &c. A naval dockyard is now constructing at Haulbowline, an island within Cork harbour. The design embraces a basin with 2000 feet of wharf accommodation, and with space for two docks leading out of the basin. The houses of the city are generally old, and not elegant, but there are many fine modern mansions. It sends two members to Parliament. Pop. in 1871, 78,382.

CORK is the external bark of a species of oak (*Quercus suber*) which grows in Spain, Portugal, and other southern parts of Europe, and is distinguished by the cellular texture of its bark, and the leaves being evergreen, oblong, somewhat oval, downy underneath, and waved. The principal supply of cork is obtained from Catalonia in Spain. In the collecting of cork it is customary to slit it with a knife at certain distances, in a perpendicular direction from the top of the trees to the bottom; and to make two incisions across, one near the top, and the other near the bottom, of the trunk. For the purpose of stripping off the bark, a curved knife with a handle at each end, is used. Sometimes it is stripped in pieces the whole length, and sometimes in shorter pieces, cross cuts being made at certain intervals. In some instances the perpendicular and transverse incisions are made, and the cork is left upon the trees until, by the growth of the new bark beneath, it becomes sufficiently loose to be removed by the hand. After the pieces are detached, they are soaked in water, and when nearly dry are placed over a fire of coals, which blackens their external surface. By the latter operation they are rendered smooth, and all the smaller blemishes are thereby concealed; the larger holes and cracks are filled up by the introduction of soot and dirt. They are next loaded with weights to make them even, and subsequently are dried and stacked, or packed in bales for exportation. In the course of eight or nine years the same tree will yield another supply of cork.

The uses of cork were well known to the ancients, and were nearly the same to which it is applied by us. Its elasticity renders it peculiarly serviceable for the stopping of vessels of different kinds, and thus preventing either the liquids therein contained from running out, or the external air from passing in. The use of cork for stopping glass bottles is generally considered to have been introduced about the fifteenth century.

The practice of employing this substance for jackets to assist in swimming is very ancient; Plutarch describes how Pontius Cominius swam across the Tiber by help of pieces of cork; and it has been applied in various ways towards the preservation of life when endangered by shipwreck. The cork jacket, revived from an old German discovery by Mr. Dubourg, to preserve the lives of persons in danger of drowning, is constructed as follows:—Pieces of cork about 3 inches long by 2 wide, and the usual thickness of the bark, are inclosed between two pieces of strong cloth or canvas, and formed like a jacket without sleeves; the pieces of cloth are sewed together round each piece of cork, to keep them in their proper situations; the lower part of the jacket about the hips is made like the same part of women's stays, to give freedom to the thighs in swimming; it is made sufficiently large to fit a stout man, and is secured to the body by two or three strong straps sewed far back on each side, and tied before; the strings are thus placed to enable any wearer to tighten it to his own convenience.

The floats of nets used for fishing are frequently made of cork. Pieces fastened together make buoys, which, by floating on the surface of the water, afford direction for vessels in harbours, rivers, and other places. In some parts of Spain it is customary to line the walls of houses with cork, which renders them warm and prevents the admission of moisture. The ancient Egyptians frequently made coffins of it. On account of its lightness cork is used for artificial legs; and from its being impervious to water, it is sometimes placed between the soles of shoes to keep out moisture. When burned it constitutes that light black substance known by the name of *Spanish black*.

In the cutting of corks for use, the only tool employed is a very broad, thin, and sharp knife; and as the cork tends very much to blunt this, it is sharpened on a board by one whet or stroke on each side, after every cut, and now and then upon a common whetstone. The corks for bottles are cut lengthwise of the bark, and consequently the pores lie across. Bungs and corks of large size are cut in a contrary direction: the pores in these are therefore downward—a circumstance which renders them much more defective in stopping out the air than the others. The parings of cork are carefully kept, and sold to the makers of Spanish black.

By exhaustion with alcohol cork yields about 10 per cent. of its weight, and the alcoholic solution, when evaporated, first deposits a white crystalline sparingly soluble substance called *cerin*, and then a yellowish non-crystalline fat called *dekacrylic* acid. The fluid being evaporated to dryness, the residue, boiled with water, furnishes another fatty yellow matter, *eulysin*, while the aqueous solution gives on cooling a sparingly soluble cinnamon-coloured body, soluble in alkalies with a crimson colour, called *corticinic* acid; and lastly, from the filtrate the red calcium salt of a tannic acid is got.

When boiled with nitric acid cork yields, among other products, *suberic* acid (which see).

CORK, Earl of. See Boyle (John) and Boyle (Richard).

CORLEONE, a town, Sicily, province and 22 miles south of Palermo, near the source of the Belici. It is well built, has several churches and convents, a prison, royal college, and some other public edifices. The inhabitants are principally engaged in agriculture. There is a mineral spring in the neighbourhood. Pop. 14,600.

CORMORANT (a corruption of the French words *corbeau marin*), the trivial name of a genus of aquatic birds included by Linné under *Pelecanus*, but properly removed thence by Brisson, to form a distinct genus, denominated *Phalacrocorax*. This term is indicated by Pliny as being the Greek name for the cormorant, though it is not employed by Aristotle, who called the bird *hydrocorax*, or sea-crow, whence the French name above mentioned. The cormorants belong to the family *Totipalmati* of Cuvier, *Steganopodes*, Illig. They are aquatic birds, having the great toe united to the others by a common membrane, and their feet are thus most admirably adapted for swimming; yet they are among the very few web-footed birds capable of perching on the branches of trees, which they do with great ease and security. The genus is distinguished by the following characters:—a moderate-sized, robust, thick, straight and compressed bill, having the upper mandible furrowed marginally, and rounded above, with the ridge distinct, unguiculated, and hooked at the point, which is rather obtuse. The lower mandible is somewhat shorter, truncated at tip, osseous throughout, and furnished at the base with a small naked coriaceous membrane, which is continued on the throat. The nostrils, opening in the furrows, are basal, lateral, linear, and scarcely visible; the tongue is double, horny, very short, and carinated above, papillous beneath, and obtuse. The occiput is very protuberant; the face and small pouch are naked; the neck is rather short, and of moderate strength; the body is compressed. The feet are short, robust, and rather turned outwards; the legs are wholly feathered, and closely drawn towards the belly; the tarsus is naked, one-third shorter than the outer toe, much compressed, and carinated before and behind. The outer toe is the longest, and edged externally by a small membrane; the webbing membrane is broad, full, and entire; the hind toe is half as long as the middle, and all are provided with moderate-sized, curved, broad, bluntish nails, the middle one being serrated on its inner edge, and equal to the others. The wings are moderate and slender, with stiff quills, of which the second or third primaries are longest; the tail is rounded, and composed of twelve to fourteen rigid feathers.

About fifteen species of cormorant are at present known, and are distributed over the whole world, engaged in the same office—that of aiding to maintain the due balance of animal life, by consuming vast numbers of the finny tribes. Like the pelicans, to which they are closely allied in conformation and habits, the cormorants reside in considerable families near the waters whence they obtain fish. It is scarcely possible to imagine any animal better adapted to this mode of life, since they dive with great force, and swim under water with such celerity that few fish can escape them. When engaged in this chase they not only exert their broadly-webbed feet, but ply their wings like oars to propel their bodies forward, which, being thin and keel-shaped, offer the least degree of resistance to the water. They swim at all times low in the water, with little more than the head above the surface, and, therefore, though large birds, might easily be overlooked by one unaccustomed to their habits. Should a cormorant seize a fish in any other way than by the head he rises to the surface, and tossing the fish into the air, adroitly catches it head foremost as it falls, so that the fins, being properly laid at the fish's sides, cause no injury to the throat of the bird. This precaution is the more necessary, as the cormorants are very voracious feeders, and are often found not only with their stomachs crammed, but with a fish in the mouth and throat, which remains until the material below is digested, and is then passed into the stomach. When standing on shore the cormorant appears to very little advantage, both on account of the proportions of its head, neck, and body, and because of its awkward manner of keeping itself erect, being under the necessity of resting upon its rigid tail feathers. But, mounted in air, these birds are of swift and vigorous flight, and when desirous of rest alight upon the branches of tall trees or the summits of rocks, where they delight to spread their wings and bask for hours in the sun. They select similar situations for building their nests, though sometimes they make them upon the ground or among reeds, always rudely and among coarse materials. In them they lay three or four whitish eggs.

That the services of birds, which are such excellent fishers, should be desired by man, is by no means surprising, and it is well known that the Chinese have long trained cormorants to fish for them. This training is begun by placing a ring upon the lower part of the bird's neck to prevent it from swallowing its prey. After a time the cormorant learns to deliver the fish to its master without having the ring upon its neck. It is said to be a very interesting sight to observe the fishing boats, having but one or two persons on board and a considerable number of

cormorants, which latter, at a signal given by their master, plunge into the water, and soon return, bringing a fish in their mouths, which is willingly relinquished. The male and female resemble each other in size and plumage; but the young, especially when about a year old, differ greatly from the adult birds. They change their thick close black plumage or moult twice a year, acquiring additional ornaments in winter. The common cormorant of Europe, *P. carbo*, which is found over the greater part of the world, is not uncommon on the British coasts. It is larger than a goose, but has a smaller extent of wing. It has been trained in this country to catch fish. Another British cormorant is the green cormorant or shag (*P. graculus*). It is smaller than the common cormorant. The little cormorant (*P. Pygmæus*) is another European species, but has not been met with in the British Isles. It is common in Hungary and other parts of Eastern Europe. Four or five species of cormorants are known to be inhabitants or occasional visitors of the American continent; but with the exception of *P. graculus*, which is very common, and breeds in Florida (though also abundant within the Arctic and Antarctic circles), they are rather rare, and only seen during winter in the United States. In some parts of Europe frequented by species of the cormorant, they commit great depredations upon the fish-ponds which are kept for the purpose of supplying the tables of the proprietors, and in Holland they are said to be especially troublesome in this way, two or three of these greedy birds speedily clearing a pond of all its finny inhabitants. From their great voracity and entirely piscivorous regimen, it will readily be inferred that their flesh promises very little to gratify the epicure. It is so black, tough, and rankly fishy, that few persons venture upon it more than once, where anything else can be had. Nevertheless, naval officers, and others, condemned by the nature of their service to situations where they are long debarred from fresh provisions, sometimes have the cormorant served at their tables, after having taken the precaution to skin it, and endeavoured by the artifices of cookery to disguise its peculiar flavour.

CORN, a hardened portion of cuticle produced by pressure, so called because a piece can be picked out like a corn of barley. Corns are generally found on the outside of the toes, but sometimes between them, on the sides of the foot, or even on the ball. They gradually penetrate deeper into the parts, and sometimes occasion extreme pain, and, from the frequency of their occurrence, hold a prominent rank among the petty miseries of mankind, and frequently exert no small influence upon the temper of individuals. A monarch's corns may affect the welfare of a nation. No part of the human body, probably, has been injured so much by our injudicious mode of dress as the feet, which have become, in general, deformed; so much so that sculptors and painters can hardly ever copy this part from living subjects, but depend for a good foot almost solely on the remains of ancient art. To this general deformity of the foot belong the corns, produced by the absurd forms of our shoes and boots. They appear at first as small dark points in the hardened skin, and in this state stimulants or escharotics, as nitrate of silver (lunar caustic), are recommended. The corn is to be wet and rubbed with a pencil of the caustic every evening. It is well to have the skin previously softened. If the corn has attained a large size removal by cutting or by ligature will be proper: if it hangs by a small neck it is recommended to tie a silk thread round it, which is to be tightened every day until the corn is completely removed. In all cases of cutting corns very great precaution is to be observed. The feet ought always to be bathed previously. Mortification has, in many instances, resulted from the neglect of this precaution, and from cutting too deep. Perhaps the most efficacious remedy for corns is the application of glacial acetic acid night and morning. This acid has a peculiarly destructive effect on the epidermis, of which corns are a hypertrophy. Another simple and generally very efficacious means, is the application of a thick adhesive plaster, in the centre of which a hole has been made for the reception of the projecting part. From time to time a plaster must be added. Thus the surrounding parts being pressed down the corn is often expelled, and at all events is prevented from enlarging. Paring with files, rubbing with fish-skin, &c., have been likewise found effective. In large cities, as London, Paris, &c., people make a business of curing corns.

CORN is the generic term for all kinds of grain used for making bread, and is applied specifically to the principal bread-stuff; in England to wheat, in the United States generally to maize, and frequently in Scotland to oats. The word, which is Anglo-Saxon, is probably a transposition of the Latin *granum*.

CORN, INDIAN. See MAIZE.

CORN APHIDES, or PLANT LICE. There are several species of insects of this numerous tribe infesting the ears of corn, barley, oats, and other grain. The *Aphis granaria* belongs to the order Hemiptera, sub-order Homoptera, genus Aphis. It is green when alive, changes to olive-brown when dead; the antennæ are very slender and tapering, composed of seven joints, the head small, eyes globose; ocelli (microscopic eyes), three in a triangle, the mouth has two maxillæ and two mandibles, thorax moderately large, abdomen stout, wings four, deflexed in repose, the superior very large; the females are often apterous. The ravages of these insects, like others of similar habits, are restrained by parasites, which multiply in proportion to their growth.

CORNARO, LUDOVICO, was descended from a Venetian family which had given several doges to Venice, and in the fifteenth century a queen to the island of Cyprus, who left that kingdom to the Venetian Republic. He was born in 1467; died at Padua in 1566. From the twenty-fifth to the fortieth year of his age he was afflicted with a disordered stomach, with the gout, and with slow fevers, till at length he gave up the use of medicine and accustomed himself to extreme frugality in his diet. The beneficial effects of this he relates in his book entitled, The Advantages of a Temperate Life. Cornaro's precepts are not, indeed, applicable in their full extent to every constitution; but his general rules will always be correct. His diseases vanished and gave place to a vigorous health and tranquillity of spirits, to which he had hitherto been an entire stranger. He wrote three additional treatises on the same subject. In his work upon the Birth and Death of Man, which he composed a few years before his death, he says of himself, 'I am now as healthy as any person of twenty-five years of age. I write daily seven or eight hours, and the rest of the time I occupy in walking, conversing, and occasionally in attending concerts. I am happy and relish everything that I eat. My imagination is lively, my memory tenacious; my judgment good; and what is most remarkable in a person of my advanced age, my voice is strong and harmonious.'

CORN-BUGS, a species of insects of the order Hemiptera, which abound in corn-fields. They are supposed to live on insects that injure the crops.

CORN-CRAKE (*Crex pratensis*) is a species of bird of the order Grallæ or Waders, and of the family

Rallidæ or rails. The crakes differ from the rails proper (*Rallus*) in having the bill shorter. The corncrake is of a reddish-brown colour. It lives in fields and meadows, and nestles and runs among the long grass. The name is expressive of its cry. It feeds on corn, worms, and insects. It is a bird of passage, frequenting the northern parts of Europe during summer, and the southern, including the Mediterranean coasts of Africa, in winter. It is a very common visitant in Britain during summer. There are several other species of crake, which are summer visitors in Britain.

CORNEA. See Eye.

CORNEILLE, Pierre, the father of French tragedy and classic comedy, and the first, in point of time, among the great authors of the age of Louis XIV., was born at Rouen, June 6, 1606, at which place his father was advocate-general. He began his dramatical career with comedy. A questionable love intrigue, it is said, was the occasion of his first piece, Mélite, played in 1629. It was followed from 1632 to 1636 by Clitandre, La Veuve, La Galerie du Palais, La Suivante, La Place Royale, L'Illusion Comique, which had great success. They were composed according to the uncritical taste of the time, but being more natural and more vigorous in style than the dramas which then held the stage, they announced the approach of a reformer endowed with talents of a higher order, and as such he was recognized even by his rivals. His Medea, produced in 1635, and imitated from Seneca, was the first indication of his talent for tragedy. Though deficient in art, it exhibited touches of eloquence and sublimity in its principal parts. His next work was Le Cid, which raised his fame at one bound to its highest pinnacle. In order to understand the universal enthusiasm which this work produced in Paris, it is necessary to remember that the French stage was then in possession of a dull and lifeless drama without any true delineation of character. The Cid belongs to the romantic school. It has been translated into numerous languages, but scarcely bears out its reputation. It was imitated from a Spanish drama of Guilhem de Castro, to whose writings, as models, his attention had been directed by M. de Chalon. The plot of the play turns upon an incident which has been the subject of much dispute. Don Rodrigue and Chimene, the son and daughter of two Spanish grandees, fall violently in love with each other. The father of Chimene is about to propose an alliance between them to the father of Rodrigue, when, in consequence of the former having obtained a court appointment for which the latter was a candidate, they quarrel, and Chimene's father strikes the father of Rodrigue. They fight, and the father of Rodrigue being worsted, seeks his son and requests him to kill the father of Chimene, which, after a good deal of soliloquizing, he makes up his mind to do and accomplishes. Chimene goes to the king to ask for vengeance, which she does not wish to obtain; but in the meantime Rodrigue repels an invasion of the Moors, and all she can obtain is leave to select a champion whom she must marry if he succeeds, while in the event of his failure she is to be compelled to marry Rodrigue. In a parting interview she tells Rodrigue confidentially the terms of the combat, and he of course triumphs and obtains her hand. All these incidents, it may be observed, occur within the twenty-four hours to which the classic unities limit the French drama. The censors of Corneille naturally objected to the morality of Chimene in these proceedings. It might also be objected, that out of incidents so forced no natural delineation of character could be expected to spring. However, the popularity of the play was unbounded. But its enemies were stimulated by the hatred of Cardinal Richelieu for its author. Corneille had been appointed as one of five authors to whom Richelieu intrusted the writing out of plays from plots furnished by himself, but he had been guilty of condemning the plot of a comedy committed to him, and the offence was unpardonable. Richelieu stimulated Chapelain to write a critique on behalf of the Academy. The critique was moderate, and while condemning the plot, admitted freely the merits of the author. It is printed in some editions of Corneille's works under the title, Sentiments de l'Academie Française sur la Tragi-Comédie du Cid.

Among other accusations brought against Corneille was want of originality. This led to his selecting as his next subject Horace (not the poet, but the Horatius of early Roman history), which is perhaps the work in which he shows the greatest invention, and is one of the most admired of his productions. It appeared in 1639; the same year appeared Cinna, which, according to Voltaire, was the *chef-d'œuvre* of Corneille; and in 1640 the Polyeucte, which other critics have styled the most original, the most touching, and the most sublime work of the author, the *chef-d'œuvre* at once of Christian tragedy and of the French theatre. There is one flaw in this work which its admirers do not seem to have noticed. The poet so far mistakes the spirit of the Christian religion as to make Polyeucte, a convert under the Roman Empire, bring martyrdom upon himself by rushing in to interrupt the Pagan sacrifices, and overthrow the altar on which the priest is sacrificing. Pompée, an inferior piece, appeared in 1641, and in 1642 Le Menteur, the greatest of Corneille's comedies, imitated, like the Cid, from the Spanish. Foote has produced an English version of it called the Liar.

From this time the success of Corneille as a dramatist steadily declined. Many of his numerous works, in spite of the fame of their author, never acquired celebrity; of these forgotten works it would be superfluous to recall the titles. On the merits of others the utmost diversity of opinion has prevailed, the same work being the subject of extravagant eulogy and unqualified condemnation. Rodogune, Heraclius, Don Sanche, and Nicomède are among the best works of his second period, 1646–52. Rodogune was his own favourite production. Some critics speak highly of it; others condemn it as showing marked indications of decline. From 1653–59 he gave up writing for the stage, and employed himself with preparing a poetical translation of the De Imitatione Christi. In the latter year he was induced to return to the drama, and persevered for fifteen years amid declining success to produce pieces generally inferior to his earlier works. Œdipe, written in 1659, and Sertorius, 1662, are the best works of this period. Tite et Bérénice, 1670, was a rival production to the Bérénice of Racine, the subject being prescribed to both poets by the Princess Henriette; but Racine's poem was a success, that of Corneille a failure. His last pieces, Pulchérie, 1672, Suréna, 1674, were the weakest as well as the last. He had been chosen a member of the Académie Française in 1647. He was dean of the Académie when he died in 1684. Besides his dramas he wrote some minor poetry, elegies, sonnets, epistles, &c., under the title of Poésies Diverses. It was his custom also to accompany each of his dramas with a short critique written by himself, and called *examen*, and he wrote also in prose three discourses, Sur le Poeme Dramatique; Sur la Tragédie; and Sur les trois Unités. Voltaire has remarked that Corneille was the first dramatist who made the sentiment of admiration the basis of tragedy instead of terror or pity. His models as a poet were Lucan, Seneca, and the Spanish poets. The quality for

which the admirers of Corneille gave him the strongest praise is sublimity. This is a quality not very easily defined, and in straining after it it is only too easy to fall into faults very much opposed to sublimity. The faults that are found with Corneille in his weaker productions are precisely such as might be produced by such an effort, declamation, inflation, abuses of sentences, and great words. His versification is less accurate and polished than that of Racine, as when he began to write the language was less formed, and his own taste in this respect probably less fastidious. There may also be observed in Corneille's delineation of character a straining after a heroic ideal, rather than a true and profound analysis of the real springs of human sentiment and emotion, in which alone an inexhaustible fund of dramatic action is to be found. It is in this respect that he compares most unfavourably with his great rival, and to this more than any other cause may probably be ascribed the premature exhaustion of his power. His personal character was amiable, but not particularly attractive. He was, like Racine, strongly impressed with religious convictions, and extremely scrupulous in his writings. He had a high idea of his own powers, but was deficient in social tact, and in conversational ability to such an extent that it is said he did not always express himself grammatically. When reproached for his carelessness in cultivating the graces of society, he would reply, Je suis toujours Pierre Corneille, and he gives the following account of himself through his favourite medium:—

> J'ai la plume féconde et la bouche stérile,
> Et l'on peut rarement m'écouter sans ennui
> Que quand je me produis par la bouche d'autrui.

CORNEILLE, THOMAS, brother of the preceding, was born at Rouen, August 20, 1625, and lived in the most friendly union with his brother Peter till the death of the latter. They had married two sisters, lived in the same house without any division of means, and were remarkable for the conformity of their tastes. A comedy which he wrote in Latin verse, while he was a scholar at the Jesuits' College, and which obtained the honour of a representation, as well as the success which attended the works of his brother, determined him to turn his attention to the drama. His first comedy, called Les Engagements du Hasard, which appeared in 1647, and was an imitation of Calderon, was successful. Many similar ones soon followed, also borrowed from the Spaniards. The number of his dramatic works is forty-two; yet most of them are now little known. His comedies, however, at the time of their appearance, were received with greater interest, if possible, than those of the great Corneille, in imitation of whom Thomas applied himself to tragedy; and his Timocrate, which appeared in 1656, was received with such continual applause, that the actors, weary of repeating it, entreated the audience, from the stage, to permit the representation of something else, otherwise they should forget all their other pieces. Since that time it has not been brought upon the boards at all. Camma, in 1661, produced an equal sensation. The spectators thronged in such numbers to witness the representation that scarcely room enough was left for the performers. His best tragedy is Ariane, which appeared in 1672, and is said to have been composed in seventeen days. Le Comte d'Essex (1678) has also retained some celebrity, although it is marred by the ignorance it displays of English manners and history. L'Inconnu, a heroic comedy, appeared in 1675, and, in 1724, was represented at a festival at the Tuileries, with a ballet, in which Louis XV. and the young lords of his court danced. In 1677 he versified Le Festin de Pierre at the request of the widow of Molière, and until recently, when the prose of Molière superseded it, it was always represented in his version. Thomas Corneille is only a dramatist of the second rank, laborious but wanting in originality, yet not without considerable resources, and more inclined to sentiment and pathos than to the sublime. He is said to have had such facility in rhyming that his brother used to have recourse to him when at a difficulty for a rhyme. In 1685 he succeeded his brother in the French Academy by a unanimous vote, and, after his election, immediately undertook the publication of the French Dictionary, which appeared in 1694. He then prefixed notes to Vaugelas' Remarks, and finally added a supplement to the Dictionnaire de l'Académie, in which he explained the terms of art and science. This may be regarded as the basis of the subsequent Encyclopédie. Thomas Corneille was also admitted into the Academy of Inscriptions. In old age he lost his sight. He died at Andelys, December 8, 1709. In his conversation he was lively and natural. A selection of his dramas is commonly found annexed to the editions of his brother's works.

CORNEL, or CORNELIAN TREE (*Cornus mascula*), a species of dogwood, a tree or shrub of the family Cornaceæ, which is distinguished by the hardness of its wood. The genus is monopetalous. It is a native of Asia and the south of Europe, and is cultivated as an ornamental plant in Britain. Its leaves are oval; the flowers, in small heads, are yellow; the berries are red or blue. The blue-berried cornels have red twigs. An oil is extracted from the berries, and they are sometimes used as preserves, being said to be possessed of tonic properties.

CORNELIA, daughter of Scipio Africanus the elder, married Tiberius Sempronius Gracchus, censor B.C. 169, by whom she was the mother of the two tribunes Tiberius and Caius. She was left a widow with a young family of twelve children, and devoted herself entirely to their education, rejecting all offers of marriage. Only three of her family survived their childhood, her daughter, married to Scipio Africanus the younger, and her two sons. Cornelia was highly educated, and united the severe virtues of the old Roman matron with the refinement which then began to prevail in the upper class society of Rome. She bore the death of her sons with magnanimity, and afterwards retired to Misenum, where she spent the remainder of her life. She exercised unbounded hospitality, and was constantly surrounded by men of letters. After her death the Roman people erected a statue to her with the inscription: CORNELIA, MOTHER OF THE GRACCHI.

CORNELIAN, or CARNELIAN (*cornaline*, French; *corniola*, Italian; from *carneus*, Latin), a precious stone of a light-red or flesh-colour, whence its name *carnaline*. It consists of silica along with minute quantities of the oxides of iron, aluminium, and sometimes of other metals. It is much used for seals, bracelets, necklaces, and other articles of minute gem sculpture; and was long a favourite stone for seals appended to watches, ornaments now in little use. It was known to the Romans, as we learn from Pliny, by the name of *sarda*, from being found originally in Sardinia. Cornelians are of various colours, from a light and fleshy red, opaque, and semi-transparent, with and without veins, to a brilliant transparency and colour approaching the ruby, from which they are, however, known by sure distinctive marks. Winckelmann describes a cornelian of this latter sort, on which was engraved a portrait of Pompey. The cornelian is a stone well fitted for engraving in intaglio, or sinking as for seals, being of sufficient hardness to receive a fine polish, and wax not adhering to it, as it does to some other sorts of stones which are

used for seals, the impression comes off clear and perfect. The number of the cornelians that were engraved by the ancients, and have reached our times, is very considerable, and nearly equal to that of all the other kinds of gems with which we are acquainted. From an ancient epithet—'cornelian of the old rock'—Pliny conceives that they were taken from a rock of that material near Babylon. He thinks they were clarified by being steeped in the honey of Corsica. The national collection at Paris, and the British Museum of London, have numerous ancient and beautiful engraved cornelians. Many of the latter were found in the field of Cannæ in Apulia, where Hannibal defeated the Romans. See CHALCEDONY.

CORNELIS, CORNELIUS, a painter, born at Haarlem in 1562, studied the rudiments of his art with Peter Ærtsens the younger, and afterwards worked at Antwerp under Peter Porbus and Giles Coignet. In 1583 he returned to Haarlem, where his great painting—the Company of Arquebusiers—established his reputation. Descamps called it a collection of figures sketched by the Genius of History. In 1595, with Charles van Mander, he instituted an academy for painting at Haarlem. His numerous pictures are rarely to be bought, on account of the great value which the Flemings set upon them. Cornelis painted great and small pieces, historical subjects, portraits, flowers, and especially subjects from ancient mythology. His drawing is admirable. He is a true imitator of nature, and his colouring is always lively and agreeable. The galleries at Vienna and Dresden contain some of his pieces. J. Mueller, H. Golzius, Saenredam, L. Killian, Matham, Van Geyn, and many others have imitated his manner. He died in 1638.

CORNELIUS, PETER VON, a celebrated German painter, born at Düsseldorf in 1787; died 7th March, 1867. He early exhibited a taste for art, and began to work at it in the illustration of calendars. He accustomed himself to copy from memory the works of Raphael and other masters. He thus acquired an early proficiency, and at nineteen was intrusted with the painting of the cupola of the church of Neuss, near Düsseldorf. It was executed in chiaroscuro, in figures of colossal size, and showed already the grandeur of conception by which he was afterwards distinguished. He soon after removed to Frankfort, where in 1810 he commenced a series of designs illustrative of Gœthe's Faust. In 1811 he went to Rome, where, together with Overbeck, Veit, and other associates he projected the formation of a new school of German art, and especially the revival of fresco painting, in imitation of Michael Angelo and Raphael. Bartholdy, the Prussian consul-general, commissioned some members of this school to paint his villa. Cornelius executed two frescoes for this purpose—Joseph Interpreting the Chief Butler's Dream, and Joseph Recognizing his Brethren. He afterwards began a series of frescoes from the Divina Commedia for the Marquis Massini, but left it unfinished in consequence of receiving a commission to execute the frescoes in the Glyptothek, then newly erected at Munich. The designs for the villa of Massini, though never painted, were engraved by Schoefer, and another series, illustrative of the Niebelungen Lied, were engraved by Amsler and Lips.

Before leaving Rome (1819) Cornelius had been appointed director of the Academy at Düsseldorf. His first work was to reorganize the Academy, and then to give his whole attention to the painting of the Glyptothek, which demanded a constant residence at Munich. He resigned the directorship after a short time, and received in 1825 that of the Academy of Munich. Simultaneously with the Glyptothek he undertook the painting with frescoes of the Ludwigs-Kirche. In these two great works he was assisted by his Munich pupils. Many of the cartoons prepared by him were painted under his superintendence by Zimmermann, Schotthauer, and others. In the Glyptothek two large halls were intrusted to him to decorate. In the one, called the Hall of Heroes, he gave a representation on a colossal scale of the leading events of the Iliad; in the other, named the Hall of the Gods, he symbolized the Grecian mythology. In the Ludwigs-Kirche the greatest painting in size and importance was the Last Judgment, of which one critic says that it is without a rival among contemporary paintings, another that is enough to say of it that in it Michael Angelo is both imitated and disregarded. Cornelius also painted at Munich the Pinakothek, a picture-gallery for which, with the assistance of his pupils, he executed an extensive series of frescoes representing the history of painting. In 1833 he made another visit to Rome, and in 1839 he visited Paris. In 1841 he was invited to Berlin by Frederick William IV., who intrusted him with the painting of the royal mausoleum or Campo Santo. The most celebrated cartoon in this series is the Four Riders of the Apocalypse. The series consists of twelve paintings, which have been engraved. Cornelius visited England in 1841, and was at Rome again in 1853. He was admitted a foreign member of the Institute of France in 1838, and a member of the Academy of Berlin in 1841. His advice and assistance were widely sought, and he executed or superintended various works besides those enumerated.

On his merits as an artist there are the widest diversities of opinion according to the sympathies of those by whom he is appreciated. Cornelius was a true representative of modern German thought in its highest phases. He introduced into art a metaphysical and subjective element which in the hands of so competent an interpreter could not but be productive of great results, but which is equally open to the severest criticism. That he was the founder of a school and threw new life into German art the mere enumeration of his great undertakings is sufficient to prove. Even his admirers, however, admit certain faults in his execution, and it would seem that in aiming at grandeur he too often failed to be natural. In seeking to develop his leading idea he subordinates details to an extent which amounts to sacrificing them, and that idea is often admittedly recondite, and requires learning and study to appreciate it. Still his admirers insist that his merits are such in the grandeur and beauty of his designs and the elevation of the tone of his execution as to overbear all faults of detail; but there are not wanting detractors who say that his excellences, whatever they may be, do not belong to the region of art, and that it is necessary to go outside of it into that of metaphysics to be able to appreciate them.

CORNELIUS NEPOS, a Roman author, the contemporary of Cicero, Atticus, and Catullus. He is supposed to have been a native of Verona, and to have died during the reign of Augustus, and is known to have written several historical and biographical works which have been lost. The only extant work attributed to him is a collection of biographies containing lives of twenty Greek heroes, some kings of Persia, Macedonia, &c., and of the Carthaginian generals Hamilcar and Hannibal. This collection was long attributed to Aemilius Probus, who lived at the end of the fourth century, but in 1569 a new edition was published by Dionysius Lambinus, who maintained that the whole was the work of Cornelius Nepos. After much discussion critics have concluded that the work is an abridgment, probably made by Probus, of a work written in the Augustan age, and

of which it appears likely, particularly from one of the lives having always been attributed to him, that Nepos was the author. These biographies have long been a favourite school-book, and popular editions of them are very numerous. Among the most complete and serviceable are those of Van Staveren, 1773; Tzschucke, 1804; Bremi, 1820; Lemaire, 1820.

CORNET, a wind-instrument of former times. There were three kinds of cornets—the treble, the tenor, and the bass. The treble and tenor cornets were simple curvilineal tubes, about 3 feet in length, gradually increasing in diameter from the mouthpiece towards the lower end. The bass cornet was a serpentine tube 4 or 5 feet long, and increasing in diameter in the same manner. This word is now employed in the compound term *cornet-à-pistons*, to designate a kind of keyed bugle which has a very agreeable tone, and is much used in orchestras and military bands. The names of Messrs. Sax of Paris and Distin of London are well known in connection with improvements in the construction of this instrument.

CORNET, in military language, is a commissioned officer in a regiment of cavalry, corresponding with the rank of ensign in the infantry. He is the third officer in a company, and bears the colours of the troop.

CORNETO (ancient *Cornuetum*), a town, Kingdom of Italy, on a lofty and precipitous volcanic ridge, 10 miles north of Civita Vecchia. Pop. 4000. Being about 3 miles from the Mediterranean, it becomes visible at sea, and with its ancient walls flanked with towers presents a very picturesque appearance. It consists generally of irregular, narrow streets, but considerable improvements have recently been made. The principal edifices are the old Gothic cathedral, built in the ninth century, and remarkable for its fine dome, portal, and lofty tower, but so much injured by lightning in 1810 that it is no longer used; the Vitelleschi Palace, a fine specimen of domestic Gothic, now used as an inn; and the town-house, decorated with frescoes. The ancient Tarquinii stood about a mile from Corneto. Part of the foundations of its walls can still be traced, and on the hill of Monte Rossi, opposite to it, is the ancient necropolis, from which great numbers of Etruscan antiquities have been excavated, which now enrich the British Museum and other collections.

CORNISH DIAMOND. A peculiar variety of quartz found in Cornwall and employed even in the sixteenth century for personal ornaments. This variety being now scarce, ordinary rock-crystal, when sufficiently transparent, is used instead.

CORN-LAWS. An adequate supply of grain for bread is evidently of the very first importance to every country, and should be as regular as is possible, since sudden fluctuations in an article of so universal necessity are injurious, and scarcity, with the consequent high prices, brings distress upon the poorer classes, and is a fruitful cause of discontent and convulsions. The best means of securing a sufficient and steady supply of this article has been a subject of great diversity of opinion, and the practice of governments has varied much at different times. The theory urged by Adam Smith, and now adopted in this country, is that government should do absolutely nothing in the matter, on the ground that farmers and merchants, if unchecked, will always form correct views of their own interest, and that their interest will coincide with that of the community. This theory is supported by a large view of the facts. In ancient times famines were much more frequent than they are now, because commerce was more restricted, less regular and extensive, and subject to more frequent obstructions. A free communication between different countries, by which the abundance of the one may be brought to supply the want of the other, has been proved to be the best security against the want of necessaries, and even of comforts and luxuries. This argument, indeed, does not bear up the extreme conclusion which has been put upon it, that any article, because of its necessity, should enjoy an absolute exemption from contributing to the necessary revenue of government; but it is conclusive against any arbitrary interference intended to regulate the course of trade. The first form of interference by legislative enactment with the corn-trade in England, beginning soon after the Conquest, was the prohibition of exportation. This might seem a natural expedient to prevent scarcity in a sudden emergency, as in the case of a short harvest in two neighbouring countries, when each might thus endeavour to keep all it had got. It is always difficult in one state of society to judge of the policy suited to another; and although the absurdity of such an expedient would be manifest where free communication produces an average of prices, it must not be concluded that it would be either superfluous or inoperative when slowness of communication and deficiency of information might lay a country open to be surprised and forestalled in the event of scarcity by a more active neighbour. But whatever temporary expediency such enactments might have, there was one inevitable disadvantage to which they were liable. They tended to limit production by restricting the market of the producer, and thus were likely in the end to aggravate the evil they were intended to obviate. The exportation of grain was prohibited by stat. 34, cap. xx. of Edward III. in 1360–61, Calais and other appointed ports being excepted. This provision was relaxed by stat. 17 Richard II. cap. vii., in 1394, by which exportation was permitted from all ports not excepted by royal proclamation. In 1436, by Act 15, cap. ii. Henry VI., the exportation of grain was permitted without license whenever the price of grain did not exceed 6*s.* 8*d.* per quarter, and barley 3*s.* 4*d.*, equal in amount of silver to 12*s.* 10½*d.* and 6*s.* 5¼*d.* of present money. In 1463 the turn of policy in favour of the agricultural interest was strengthened by Act 3 Edward IV. cap. ii., which prohibited importation until the price exceeded the limit at which exportation was permitted. This was the beginning of protection properly so called. These acts continued to regulate the export and import of grain till the reign of Henry VIII., when, in consequence of the change in the value of money, exportation was prohibited except by license from the crown. This arbitrary regulation continued for twenty years; but in 1554, in the reign of Mary, the former system was resorted to, with a rise in the standard price. The falling value of silver necessitated further changes in the standard during the reign of Elizabeth. In 1570 an act was passed, 13 Elizabeth, cap. xiii., permitting the exportation of corn from particular districts on a duty of 1*s.* per quarter for wheat, and 8*d.* for other grain, unless proclamation to the contrary was issued by government, and enjoining the local authorities in the respective countries to consult with the principal inhabitants to ascertain when exportation could be permitted with advantage. This act was caused by the great inequality of prices arising from want of communication throughout the kingdom. So defective was the communication that one district might be suffering from famine, while in others from which it could derive no aid the supply was overabundant. Another act raised the duties to 2*s.* and 1*s.* 4*d.*, and simplified the arrangements for exportation. On the restoration of Charles II. duties were imposed both on exportation and importation, while

the old principle of a standard price, beyond which exportation was prohibited, was retained. The price fixed was in 1660 40*s.*, in 1663 48*s.*, and in 1670 at 53*s.* 4*d.* The first of these acts imposed high duties both on imports and exports; the second reduced the duty on imports to 9 per cent. *ad valorem*, and on exports to 5*s.* 4*d.* per quarter; the third prohibited importation till the price reached 53*s.* 4*d.*, and then imposed a duty of 8*s.* per quarter. At the Revolution a new policy still more favourable to the agricultural interest was adopted. By act 1 William and Mary, cap. xii., a bounty was granted on the exportation of corn. The amount of the bounty was 5*s.* for every quarter of wheat exported while the price was at or under 48*s.*, with corresponding prices for other grains. The duties on exportation were still in force, but these were abolished by act 11 and 12 William and Mary, cap. xx., in 1700, so as to give free scope to the new policy. This policy continued to prevail, with variations, for more than a century, and appears to have had the effect of stimulating a forced exportation of grain. The amount of bounty paid between 1740 and 1731 was £1,515,000. The actual export in 1750 was 1,667,778 quarters of all sorts.

It is somewhat remarkable that economists have not agreed as to whether the ultimate tendency of the bounty was to raise or lower the prices of grain, Mr. Malthus maintaining the former position, and Mr. M'Culloch the latter. As the profits of farmers and exporters would be regulated by the ordinary profits of trade, the whole of the bounty may be regarded as a bonus paid by government upon the rent of land, and particularly of the poorer lands, which would be brought under cultivation by the operation of the bounty. Further, the bounty would have the tendency to raise the price of grain to home consumers, also to the advantage of the land-owner, to the full extent of the amount of the bounty, namely, 5*s.* per quarter, by putting the producer to that extent on more favourable terms for procuring a foreign customer. But as the obstructions to the exportation of grain cannot all be overcome by a bounty, this tendency would only operate in as far as exportation was actually forced, while the hope of carrying it to a greater extent might have a contrary tendency. It must also be borne in mind that the bounty only operated when grain was under a fixed price, while the hope of taking advantage of it would lead producers to maintain the same extended production every year, so that in dear and scarce seasons this extended production would tend only to the advantage of the home consumer. Hence it would appear that the bounty was justly designed to have the effect it was intended to have—to maintain an approximation to an equilibrium of price, and correct to some extent the natural fluctuations caused by the change of seasons. As long as the country continued an exporting one it could not, if internal communications were moderately good, suffer from famine prices. The bounty was thus a practical expedient for doing in a close market what is now effected in an open one by free importation.

The bounty, however, proved only a temporary expedient; the exportation of grain reached its highest point about 1750. From this period an important revolution in the mercantile history of the country is to be noted. Up till this time it had been normally a grain-exporting country, the average annual produce being rather over than under the wants of the inhabitants, and the numerous prohibitions on the importation of grain had consequently been of comparatively little importance. From this time, notwithstanding the bounty, exportation began steadily to decline. This was due mainly to an increase of population resulting from the expansion of trade attendant on the development of our colonial connection, and subsequently on the rapid course of mechanical improvement in manufactures which gave a stimulus to our whole foreign trade. By 1773 the rise in prices and decline of exportation had necessitated a new legislation for grain. This was effected by Mr. Burke's measure (Act 31 George III. cap. xxx.) passed in that year. By this act the bounty on exportation was to cease when grain rose to 44*s.* per quarter, and above this price exportation was prohibited altogether! a strange inconsistency which has been noted by Adam Smith, but which is easily accounted for by the difficulty of getting rid of old habits. The importation of grain was allowed at the nominal duty of 6*d.*; when the price rose above 48*s.*, free importation of corn under bond for re-exportation was also allowed. This law was not only a great improvement upon what had preceded, but upon what followed it. For some time after the passing of this law the balance still fluctuated between a preponderance of exports and imports, influenced by the immediate commercial prosperity of the country and the state of the harvest for the current year, but the country was now surely progressing in population at a rate at which home production could not keep pace. From 1778 Great Britain became permanently a grain-importing country. In 1791 a modification of the act of 1773 was effected. This act (31 George III. cap. xxx.) raised the price at which importation was permitted at the duty of 6*d.* to 54*s.*, a duty of 2*s.* 6*d.* was levied between 50*s.* and 54*s.*, and a prohibitory duty of 24*s.* 3*d.* imposed under 50*s.* The maritime counties were divided into districts, and importation was regulated for periods of three months by the average price in each district. The bounty continued as before, but exportation was permitted up to 46*s.* In 1804 importation was still further restricted in consequence of the complaints of the agricultural interest by Act 44 George III. cap. cix. The price at which importation was permitted at the 6*d.* duty was raised to 66*s.*, the 2*s.* 6*d.* duty was levied between 63*s.* and 66*s.*, and the prohibitory duty of 24*s.* 3*d.* was imposed below 63*s.* Importation was regulated by the average price over the kingdom. In 1814 the state of the corn trade was again found unsatisfactory, and a parliamentary inquiry was held. The bounty on exportation having become ineffective, was repealed, and at the same time the restriction on exportation above the standard price was removed, and the export trade left perfectly free (Act 54 George III. cap. lxix.) The act of 1804 had also proved completely inoperative, as the price of wheat had only once fallen as low as 66*s.* The agricultural interest was desirous of additional protection in consequence of the return of peace. A bill was brought in for this purpose in 1814, but rejected. In 1815 Act 55 George III. cap. xxvi. raised the limit below which importation for home consumption was prohibited to 80*s.* Corn from the British plantations of America was, however, permitted to be introduced at a lower scale of duties. The price for wheat was 67*s.* and other grain in proportion. In 1822 a new act was passed to supersede the act of 1815. This act (3 George IV. cap. lx.) lowered the prices at which importation could take place for home consumption to 59*s.* for the produce of the North American colonies, and 70*s.* for other wheat, and imposed a pretty high sliding-scale of duties for importation above these rates. This act was not to come into operation until the ports were open under the preceding act. In 1828, by Act 9 George IV. cap. lx., the prohibition on importation was withdrawn and the sliding-scale substituted as the sole regulating principle of importation. The duty was fixed at 23*s.* 8*d.* when the home price was

64*s.* per quarter; 16*s.* 8*d.* when it was 69*s.*; and 1*s.* when it was above 73*s.* The duties were determined by an average price based on compulsory returns and published weekly in the Gazette. This law continued in operation till 1842, when it was modified by Act 5 and 6 Victoria, cap. xiv., passed at the instance of Sir Robert Peel's government. The principle now adopted was a maximum duty of 20*s.* when the price was under 51*s.* per quarter, a minimum duty of 1*s.* when the price was at or over 73*s.*; a graduated duty, falling at the rate of 1*s.* per quarter, between these extremes. The principle of graduation was a fall of 1*s.* in duty for every rise of 1*s.* in price; but there were two rests in the scale, the duty was fixed at 18*s.* when the price was between 52*s.* and 55*s.*, and at 6*s.* when it was between 66*s.* and 69*s.* In 1846, in consequence of the agitation of the Anti-corn-law League, the duty on importation was repealed, leaving only a nominal duty of 1*s.* per quarter (Act 9 and 10 Victoria, cap xxii.) Finally, the 1*s.* duty was repealed in the budget of 1869, and the importation as well as the exportation of corn is now entirely free.

In addition to the restrictions upon the foreign trade in corn the inland trade was subjected to an interference of the most mischievous kind, dating from a period at least as early as the regulations affecting exports and imports. Fictitious crimes called forestalling, engrossing, regrating were created, and heavy penalties inflicted, under pretence of them, on the buying and selling of corn.

The Athenians had laws prohibiting the exportation of corn, and requiring merchants who loaded their vessels with it in foreign ports to bring their cargoes to Athens. The public provision and distribution of corn was an important branch of administration at Rome, and very intimately connected with the public tranquillity. The regulation of the supply of corn and the trade in the article have been a fruitful subject of legislation in modern Europe. But it is to be observed that the public solicitude and current of legislation take this direction only in populous countries, or at least those in which the population presses hard upon the means of domestic production of bread-stuffs; for a country of which, like Poland, the staple export is corn, needs to take no measures for securing a supply; and as flour and Indian-meal are great articles of exportation in America, that country has had no occasion for laws to guard against a famine, since the ordinary course of industry and trade gives the greatest possible security, by producing a surplus of provisions, which a high price at home, in anticipation of any scarcity, will be sure to retain for the supply of domestic wants. In agricultural countries the object of solicitude is to supply the want of arts and manufactures, as in populous and highly-improved countries it is to supply the want of food.

But the laws directed to this object have been very various, and some of them contradictory; for as in Athens so in England, at one period the laws prohibited the exportation of corn; whereas at another period, and for a very long one in the latter country, a bounty was given on the exportation; and both these laws had the same object, viz. the adequate and steady supply of the article.

CORN MOTHS (*Scopula frumentalis* and *Pyralis secalis*). Several allied species of these insects live in the caterpillar state in the ears of grain, eating within the sheath, and migrating from one to another, rendering the ears white and empty. The *Scopula frumentalis* (named *Pyralis frumentalis* by Linnæus) expands about 1 inch; the palpi are minute, horns slender, eyes prominent, thorax and abdomen moderately stout, superior wings are of a shining, pale, ashy green above, and grayish green below. It is a native of Sweden and other parts of Europe, but is not yet recognized in this country. These caterpillars are attended by a parasite, *Ichneumon secalis*, which lays its eggs on them.

CORN SAW-FLY (*Cephus pygmæus*), another of the insects which prey upon the corn plant, is of a shining black colour; the head rather large, with prominent eyes, and three minute ocelli on the crown; the antennæ are inserted in front of the face, they are long and slender, composed of twenty-one joints; the thorax is oval and not broader than the head; the abdomen is sessile, or attached by its entire base, rather long, slender, and slightly compressed; the four wings are transparent and iridescent; the legs are bright yellow, with black stripes on the outside. The female is darker than the male, and the abdomen is stouter and shorter.

This insect, along with some others of similar species, attacks the stalks of corn and rye, by destroying which they render the crop unproductive. M. Dugaignean, who observed the habits of one of the species (*Sirex pygmæus*), says that after pairing they pierce the stalk of the rye below the first knot to deposit an egg in its interior, which is early hatched by the sun's rays concentrated close to the earth among the straw. The larvæ live upon the interior of the straw, which is very tender, and the nutritive juices of the plant. When it is able to perforate the knot in the straw it ascends to a greater height. Some have been found to pierce all the knots and reach the top. When it has attained its full growth it descends again, and cuts the straw level with the ground about the time when the grain is maturing. After cutting off the straw to the root it descends in the stump below the ground, stopping the orifice with the saw-dust and with excrement, and makes itself a transparent covering, much larger than its own bulk, in which it rests for eight months. This species is comparatively rare in wheat. The *Cephus pygmæus* is very abundant in England in corn fields and the grasses in woods during the month of June. There is a parasitic ichneumon which engages actively in the destruction of the larvæ of the corn saw-fly.

CORNU COPIÆ, horn of plenty. See ACHELOUS and AMALTHÆA.

CORNWALL, a maritime county of England, forming the south-western extremity of the island, bounded E. by Devonshire, and surrounded on all other sides by the sea. Its form is irregularly triangular, and the coast deeply indented. Its area is 1365 square miles or 873,600 acres. The coast line from N.E. to S.W. has been scooped out by the sea into a number of shallow bays, of which that of St. Ives is the principal, while the most prominent headland is that of Trevose Head. The south coast is much more broken, and is marked both by bolder promontories and deeper bays. Of the former, proceeding east, the most prominent are Tol Pedn, Penwith, the Lizard, &c. Of the latter the most extensive and important are Mount Bay, Falmouth Bay and Harbour, Stanstell Bay, Whitsand Bay, and Plymouth Sound. Intermediate between these two coasts is the remarkable promontory bearing the appropriate name of Land's End, and terminating in granite cliffs about 60 feet high. Some of the cliffs exceed 400 feet in height. At the Land's End terminate the hills of the Devonian Range. The part of this range belonging to Cornwall stretches from N.E. to S.W., forming the principal watershed of the county. The nucleus of this range is granite, which occasionally bursts through the surface and forms huge insulated masses, but is more generally covered with extensive slate strata, provincially called *killas*. The granite

is generally of a gray or bluish-gray colour, and the decomposition of portions exposed to the air has formed valuable beds of kaolin, which is largely employed in the potteries in making the finer kinds of ware. The slate, except in the north, is seldom of a quality which enables it to be used for roofing. The most elevated points of the Devonian Range in Cornwall are Brown Willy, 1368 feet; Caradon Hill, 1208 feet; Kit Hill, 1067 feet; and Hensbarrow Beacon, 1034 feet. The rivers of Cornwall are numerous but short. Flowing to the coast they are accessible to the tide, and thus afford considerable facilities for inland navigation, which has been increased by the formation of canals, and of valuable harbours at the mouths of the rivers. The Tamar forms the boundary between Cornwall and Devon, and belongs more properly to the latter county. The climate, owing to the elevation and exposure of the surface, is very variable. The soil, consisting of decomposed slate, admits of easy drainage, but requires much manure. In many of the more elevated districts much of the land is almost barren. The total acreage under crops of all kinds in 1872 was 512,669, of which 356,288 were under corn and other rotation crops, and 135,278 under permanent pasture. The number of cattle in 1872 was 135,662; sheep, 367,208; agricultural horses, 26,985. The mines of copper and tin still constitute the richest treasures of the county, though the value of both has been diminished. The chief mining district is in the south-west part of the county, stretching from St. Agnes on the north-west coast by Redruth and Camborne, to the neighbourhood of Helston. The lodes or veins of copper and tin usually run about east and west, penetrating or alternating with the clay-slate and granite. The depth of the veins is practically unlimited, exceeding the extent to which machinery has yet been found capable of working them, hence the art of mining has been carried to greater perfection here than in almost any other part of the world. The Cornish engines are famous for their magnitude and the wonderful labours which they perform; and the miners are unequalled for the boldness, skill, and perseverance which they manifest in tracing the ore to profound depths. Several mines exceed 350 fathoms. In the Botallack Copper Mine, situated close to Cape Cornwall, a few miles north of Land's End, the workings are on the very verge of the cliff, and descending beneath the sea, are carried 480 feet beyond low-water mark. The dashing of the waves is distinctly heard by the miner at his work, and in stormy weather the large stones driven towards the beach grate upon each other with a noise resembling thunder. Besides tin and copper, silver, lead, zinc, iron, manganese, antimony, cobalt, and bismuth are found in comparatively small quantities. According to the Stannary Court returns the total quantity of ores of all kinds raised in the county in 1871 was 92,060 tons, realizing £1,382,528. There were 16,758 tons of black tin, value £1,058,175; and 42,761 of copper ore, realizing £190,510. There are no manufactures, but the fisheries, particularly of pilchard and mackerel, are valuable. The chief exports are minerals and fish.

At the time of the Roman conquest Cornwall was occupied chiefly by tribes of Cimbri and Damnonii, and became included in the province of Britannia Prima. After the Romans withdrew the natives regained their independence, and retained it till the time of Athelstane, when they were subdued by the Saxons. Their Celtic origin is fully established by the abundance of rude monuments spread over the country, and consisting chiefly of unwrought stones placed erect, singly or in circles, with others laid across. Their language also was a Celtic dialect, and under the name of Cornish continued to be partially spoken till the commencement of the present century. The inhabitants were formerly much addicted to gymnastic sports, especially wrestling, the love of which still prevails. Cornwall comprises nine hundreds, the Scilly Isles, and nine municipal boroughs. It is divided for parliamentary purposes into East and West Cornwall, each returning two members.

CORNWALL, Duke of, a hereditary title of the eldest son of the sovereign of Great Britain. Cornwall is a royal duchy, the revenues of which belong to the Prince of Wales for the time being. The title of Prince of Wales is conferred by special creation, that of Duke of Cornwall descends by inheritance. The dukedom of Cornwall was created for the Black Prince in 1337.

CORNWALL, Richard, Earl of. See Richard, Emperor of Germany.

CORNWALLIS, Charles, Marquis of, was born in 1738, and received his education at Eton, and at St. John's College, Cambridge. Devoting himself to the profession of arms, he served in 1761 in a campaign of the Seven Years' war as aide-de-camp to the Marquis of Granby, was appointed aide-de-camp to the king in 1765, and colonel of foot in 1766, and after passing through all the various promotions he obtained the rank of general. He represented the borough of Eye in Parliament until the death of his father in 1762, when he succeeded to the peerage. In 1770 he was made governor of the Tower. In Parliament he generally supported the ministry, but exercised an independent judgment on several important questions. In particular he was opposed to the policy which brought on the American war; but though offered a special leave of absence from the king he sailed with his regiment when it was ordered to America in 1776. He served with distinction under Generals Howe and Clinton in the campaigns of 1776–79 in New York and the Southern States, and in 1780 was left in independent command in South Carolina, with 1000 men. He defeated General Gates at Cambden, 16th Aug. 1780, and General Green at Guildford, 15th March, 1781. He then invaded Virginia, but after moving his forces according to successive and contrary instructions from Sir H. Clinton, he was besieged in York Town, where he had intrenched himself, and compelled to surrender on 19th Oct. 1781. This disaster proved decisive of the war. Soon after his return to Britain he was removed from his place of governor of the Tower of London (1782), but was reappointed in 1784, and retained it until his death. In 1786 Lord Cornwallis was sent out to India with the double appointment of commander-in-chief and governor-general; and not long after the government of Bengal declared war against the Sultan of Mysore for an attack upon the Rajah of Travancore, the ally of the British. The first campaign was indecisive; but in March, 1791, Lord Cornwallis invaded Mysore in person, and captured Bangalore in March; and in the year after besieged the city of Seringapatam, and obliged the sultan, Tippoo Saib, to sue for peace, and surrender a large portion of his dominions. On the conclusion of the war Lord Cornwallis returned to Britain, and in 1792 was created marquis, appointed master-general of the ordnance, and admitted a member of the privy-council. In 1798, at the time of the rebellion, he was appointed Lord-lieutenant of Ireland, which office he filled until 1801, conducting himself with great firmness and judgment. In the same year he was sent to France, where he signed the Peace of Amiens. In 1804, on the recall of the Marquis Wellesley, he was again appointed Governor-general of India, and the follow-

ing year died at Ghazipore, in the province of Benares.

CORN-WEEVIL, perhaps the most destructive insect which preys upon stored corn in England. There are various species: they belong to the order Coleoptera, family Curculionidæ, genus Calandra. The *Calandra granaria* is smooth, elliptical, and somewhat depressed, of a dark chestnut colour; head semi-globular, with a longish, smooth, cylindrical proboscis, slightly curved and punctured, longer and slenderer in the female than the male. There are two deep channels before the eyes, which are black and depressed. The antennæ are inserted in the sides of the rostrum, close to its base; they are nine-jointed, and about as long as the rostrum. The thorax is oval and truncated, about twice the breadth of the head, but narrowing suddenly before: it is punctured with oval points. The abdomen is oval, except where it joins the thorax in a bisinuous line. The elytra are exactly equal to the thorax and head. The six legs are punctured, strong and stout. Some of the species have serviceable wings, but the *C. granaria*, in this country at least, is destitute of organs of flight. These animals are difficult to extirpate, as they bury themselves among the corn, rendering many remedies abortive. The best security seems to be to keep the store-houses clean and well-aired, and to stir and turn over the grain frequently.

CORO, a seaport town, Venezuela, capital of province of same name, on El Golfete, a bay of the Gulf of Maracaybo, 2¼ miles S.W. from the Caribbean Sea; lat. 11° 24′ N.; lon. 69° 46′ W. The trade was once considerable with the West India Islands in mules, goats, hides, sheep-skins, cheese, &c., but is now much fallen off; as is also the town since 1636, when the seat of government was transferred from it to Caraccas. Pop. 4000.

COROLLA. See BOTANY.

COROLLARY (in Latin *corollarium*), a collateral conclusion, following from a proposition demonstrated.

COROMANDEL, COAST OF (*Cholomandala*), a name applied to the east coast of the Indian Peninsula. The whole coast, from Point Calymere, lat. 10° 18′ N.; lon. 79° 51′ E., to Balasore, lat. 21° 28′ N.; lon. 87° E., is usually comprehended under this designation; but the name is properly applied only to that part of it south of the mouth of the Kistna, about lat. 16°, the more northern parts being the coasts of Golconda and Orissa. The Coromandel coast is open, sandy, and has no secure harbours; the surf, continually beating on it, renders landing difficult, often dangerous, and is only to be accomplished in native boats of a peculiar construction. The N.E. monsoon, which sets in about the middle of October, is frequently accompanied with violent hurricanes; nor is serene weather expected till the middle of December. The south wind sets in about the middle of April. During the continuance of the hot winds the coast of Coromandel resembles a barren wilderness.

CORONA, SOLAR. See SOLAR CORONA.

CORONA AUSTRALIS (the *southern crown*), one of Ptolemy's southern constellations.

CORONA BOREALIS (the *northern crown*), one of Ptolemy's northern constellations.

CORONATION, a solemn inauguration of a monarch with religious ceremonies, which, in ancient times, when the right of succession to the throne was more uncertain or disputed than at present, or when the right to govern could not be obtained without undertaking certain formal obligations, was deemed more necessary than in modern times. This act is not considered necessary for establishing the rights and obligations of rulers and subjects; but it is very proper as a means of reminding both parties in a solemn way of the nature of their duties. The essential parts of the coronation are, first, the oath which the monarch takes, that he will govern justly, will always consult the real welfare of his people, and will conscientiously observe the fundamental laws of the state; and, secondly, the placing of the crown upon his head with religious solemnities (prayer and anointing). In England kings have been anointed and crowned in Westminster Abbey, even to the latest times, with great splendour, and the observance of ancient feudal customs, many of which are very singular. So also in France, where the church of the Archbishop of Rheims has from ancient times enjoyed the privilege of the celebration of this ceremony. The coronation oath of the king or queen of Great Britain is prescribed by 1 William and Mary, cap. vi., modified by 5 Anne, cap. viii. xxxix., 40 George III., cap. lxvii. The officiating archbishop or bishop, usually the Archbishop of Canterbury, demands of the king or queen, 'Sir (or madam), is your majesty willing to take the oath?' and on the king or queen answering, 'I am willing,' the archbishop or bishop ministereth these questions; and the king or queen, having a copy of the printed Form and Order of the Coronation Service in his hands, answers each question severally as follows:—

A. or *B.* Will you solemnly promise and swear to govern the people of this United Kingdom of Great Britain and Ireland, and the dominions thereto belonging, according to the statutes in Parliament agreed on, and the respective laws and customs of the same?

K. or *Q.* I solemnly promise so to do.

A. or *B.* Will you, to the utmost of your power, maintain the laws of God, the true profession of the gospel, and the Protestant reformed religion established by law? And will you maintain and preserve inviolably the settlement of the United Church of England and Ireland, and the doctrine, worship, discipline and government thereof as by law established within England and Ireland, and the territories thereunto belonging? And will you preserve to the bishops and clergy of England and Ireland, and to the churches there committed to their charge, all such rights and privileges as do, or shall appertain unto them, or any of them?

K. or *Q.* All this I promise to do.

After this the king or queen, laying his or her hand upon the holy Gospels, says, 'The things which I have here before promised I will perform and keep, so help me God'; and kisses the book. The oath is afterwards signed. We have given the oath in the form last administered, but the phrases having reference to the Irish Church are no longer in force. The Church of Scotland is not mentioned in the coronation oath; the sovereign is, however, required to take a separate oath on his or her accession to the crown to preserve the government, worship, and discipline of the Church of Scotland.

CORONER, an ancient officer at the common law in England who has principally to do with pleas of the crown. There are usually four or six coroners appointed for each county of England. They are chosen for life by the freeholders in virtue of a writ *de coronatore eligendo*, directed to the sheriff. By 7 and 8 Victoria, cap. xcii., coroners may be appointed for districts within the county instead of for the county at large. In every borough having a separate quarter-session a coroner must be appointed having exclusive jurisdiction within the borough. The chief part of the coroner's duty is to inquire into the cause of the death of persons killed or dying suddenly. In England he inquires also into the cause of death of persons dying in prison. His examination is made in all cases with the aid of a jury, in sight of the body, and

at the place where the death happened. Coroners may also admit to bail persons charged with manslaughter (22 Victoria, cap. xxxiii.) In England the coroner has also to inquire concerning shipwrecks, and certify, in any particular case, whether there be an actual wreck or not, and who is in possession of the goods; also to inquire concerning *treasure trove;* that is, gold or silver, which appears when found to have been purposely hidden, and remains unclaimed. Such treasure, in England, belongs to the sovereign. The coroner in that country is also the sheriff's substitute; and when an exception can be taken to the sheriff, for kinship or interest, process is awarded to the coroner. In those of the United States where there are coroners, their principal duty is to inquire into the causes of violent or extraordinary death. In Connecticut the duty is performed by a justice of the peace or a constable.

CORONET, an inferior crown belonging to the British nobility. The coronet of a British duke is adorned with strawberry leaves; that of a marquis has leaves with pearls interposed; that of an earl raises the pearls above the leaves; that of a viscount is surrounded with pearls only; that of a baron has only four pearls.

CORPORAL. This word is written in the same or in a similar manner in many languages, and at first sight would seem to be derived from *corps* (body); but it originates, in fact, from the French *caporal*, and the Italian *caporale*, which are derived from *capo*, the Italian form of the Latin *caput* (the head). The change of the first syllable, *ca*, into *cor*, is of much antiquity. Du Fresne uses the Low Latin term *corporalis*. From this author it appears that *corporal* formerly signified a superior commander; but, like *captain* and many other words, it has sunk in its dignity. A corporal is now a rank and file man, with superior pay to that of common soldiers, and with nominal rank under a sergeant. He has charge of one of the squads of the company, places and relieves sentinels, &c. Every company in the British service has three or four corporals. In armies in which privates may advance to the highest ranks, as in France, Prussia, &c., great care is taken in selecting corporals. In fact, they are officers of much importance, associating as they do with the privates, over whom their superiority of rank gives them much influence. The feeling of military honour, good morals, and emulation in the discharge of duty, are, in a great degree, to be infused into the mass by means of the corporals.—A corporal of a man-of-war is an officer who has the charge of setting and relieving the watches and sentries, and who sees that the soldiers and sailors keep their arms neat and clean: he teaches them how to use their arms, and has a mate under him.

CORPORATION is a civil or political body in which are vested certain rights or privileges with a view to their preservation in perpetual succession. A corporation may consist of one person, when it is called sole; or of a number of persons, when it is called aggregate. When a corporation is vested in a single person that person is looked upon in regard to the rights of the corporation as holding a representative or official position, and these rights belong to and are transmitted by him in virtue of this position, and not as natural rights. In like manner the rights and powers of an aggregate corporation do not consist of the natural rights of the members, but of the rights held and duly exercised by the terms of the corporation. The legal divisions of corporations in England are into spiritual, intended to perpetuate the rights of the church; and lay, instituted for temporal purposes. The latter are divided into civil and eleemosynary. The former include municipal corporations, universities, &c.; the latter all corporations established for the administration of charitable funds, as hospitals, colleges in universities, &c.

The highest sole corporation in any state is the sovereign, who represents the state, and the greatest aggregate corporation is the state itself; from these all other corporations proceed. Subordinate corporations are created either by a charter conferred by the authority of the sovereign, by act of Parliament, or by prescription. A corporation formed by royal charter transacts business under the authority of a common seal, has a right to sue and be sued, and to hold property under its corporate name. A corporation founded by act of Parliament has its rights defined in the act to which it owes its origin. A corporation founded by prescription has only such rights as common law and custom confer. Corporations may be founded indirectly on acts of Parliament. See JOINT-STOCK COMPANIES.

CORPORATION AND TEST ACTS. The corporation act, passed in the 13th Charles II. cap. i. sec. 2, 1661, prevented any person from being legally elected to any office belonging to the government of any city or corporation in England, unless he had, within the twelvemonth preceding, received the sacrament of the Lord's supper according to the rites of the Church of England; and enjoined him to take the oaths of allegiance and supremacy when he took the oath of office. The test act, 25 Charles II. cap. ii. 1673, required all officers, civil and military, to take the oaths, and subscribe a declaration against transubstantiation in the courts of King's Bench or Chancery, within six months after their admission; and also within the same time to receive the sacrament of the Lord's supper according to the usage of the Church of England, in some public church. The corporation act was principally directed against Protestant Nonconformists; the test act against Roman Catholics. In the year 1828 they were both abolished.

CORPS (French for *body*), a word often used in military language, many of the terms of which are derived from the French, they having begun the organization of armies on the system which now prevails. The term is applied to various kinds of divisions of troops.

Corps d'armée is one of the largest divisions of an army (the German *Heeresabtheilung*).

Corps de garde, a post occupied by a body of men on watch; also the body which occupies it.

Corps de reserve, a body of troops kept out of the action, with a view of being brought forward if the troops previously engaged are beaten, or cannot follow up their victory, or are disorganized.

Corps volant (a flying body) is a body intended for rapid movements.

CORPULENCE, the state of the human body when loaded with an excessive quantity of flesh and fat. The flesh forms the muscular system; and its extent being limited by the form of the particular muscular parts, its quantity can neither exceed nor fall below a certain bulk. The fat is much less limited, and the production and deposition of it is confined to no such definite form. The formation of the muscular fibres, or the change of blood into flesh, takes place in the capillary system, formed by the minutest portions of the arteries at their termination in the muscles. (Concerning the production of fat, see FAT.) If blood is copiously furnished with nutritive matter, it is converted readily into muscular fibres and fat. The secretion of fat depends, in a certain degree, on the state of the health. Children and females have a larger proportion of it than adult men. It is promoted by rich diet, a good digestion, corporeal inactivity, tranquillity of mind, &c. There is, however, a diseased state of the system, which, in-

dependently of all these influences, will increase the production and deposition of fat. We see young people and men, even such as are intelligent and continually engaged in active business, very corpulent. The enormous corpulence of many men appears to bear no proportion to their food, and is evidently a disease, as many other secretions in the body; for example, the preparation and secretion of the bile, saliva, &c., are augmented by disease. Sandiford mentions an unborn child, in which he observed a monstrous mass of fat. Tulpius saw a boy five years old, who weighed 150 pounds. Bartholini makes mention of a girl aged eleven years, who weighed above 200 pounds. John Love, a bookseller of Weymouth, who died in October, 1793, weighed 26 stone, or 364 pounds, and was absolutely suffocated by excessive fatness. Edward Bright, grocer of Malden, in Essex, when only twelve years old, weighed 10 stone 4 pounds, or 144 pounds; when twenty, he had increased to 24 stone, after which he gained 2 stones yearly; for, at his death, which took place in 1750, in the thirtieth year of his age, he weighed 44 stone, or 616 pounds. His height was 5 feet 9½ inches. He is said to have been in the habit of drinking 1 gallon of small beer daily, and once for a wager, seven young men of twenty-one years of age were included in one of his waistcoats. Daniel Lambert, who was exhibited in London in 1806, when only twenty-three years of age, weighed 30 stone. When in London, his weight was 50 stone, or 704 pounds, and his height 5 feet 11 inches; he measured 9 feet 4 inches round the body, and 3 feet 1 inch round the leg. A Canadian, named Maillot, who exhibited himself in Boston in 1829, weighed 619 pounds. Corpulency is often only the repletion of the cells of the cellular membrane with watery, gaseous, and vaporized matter, arising from a marked tendency to disease, and often the commencement of actual dropsy. Moderate corpulence (*embonpoint*, in French) is consistent with health, and is not opposed to beauty, as it prevents angularity and unevenness in the surface of the body, and gives the parts rotundity. For this reason moderately corpulent women and men preserve a beautiful and youthful appearance longer than lean persons. But if corpulence is excessive, it becomes troublesome and at length dangerous. Water should then be drunk instead of wine; milk, beer, and brandy should be avoided; active bodily exercise should be taken, and employment provided for the mind. Anxiety soon takes off superfluous fat, though grief sometimes produces it. In what cases medicine is to be resorted to, and what kinds should be used, must be left to the judgment of physicians. People sometimes resort to violent and injurious means to rid themselves of superfluous flesh.

In curing corpulency due attention must be paid to the regulating of the diet, exercise, and sleep of the individual. Especial attention must be given to the kind of diet. Avoid all kinds of fat-forming food, such as fat, cream, butter, sugar, farinaceous food. See that bread is well toasted before eating. Skim-milk, lean animal food, green vegetables, eggs, &c., may be partaken of. The most noted case of cure is that of Mr. Thomas Wood, miller, of Billericay, in Essex, whose case is related by Sir George Baker in the Philosophical Transactions. When at the age of forty-four this individual was of a monstrous size, and was habitually suffering under severe gout and rheumatism, attended with thirst, heartburn, pain in the stomach, headache, and giddiness, and had even had two severe fits of epilepsy, with a constant horror of being suffocated after every meal. But he was gradually freed from all these dreadful complaints by making a complete change in his mode of life. First, taking small beer instead of strong ale, then drinking water only; using dumb-bells, then leaving off drinking even water; and next abstaining from butter and cheese, and lastly, all animal food: confining himself for several years to a sort of hasty pudding, made of milk, sea biscuit, and an egg, and abridging his hours of sleep to seven, and labouring with a spade in his garden. His voice, which had been lost, returned. He became active, vigorous, and cheerful, and attained the age of sixty-four years—dying at length from an inflammation in his bowels—a disease hereditary in his family. In nine cases out of ten corpulency may be traced to the pernicious habit of swilling large quantities of malt liquor, or milk, or cream, or tea; and nothing is more efficacious than to abstain, as much as possible, from over indulgence in the use of fluids. Some writers on corpulency have recommended the use of Castile soap in pills, or boluses, taken to the extent of two or three drachms daily, but the safer plan is to follow the example of the miller of Billericay. See Dr. Fleming's Pamphlet on Corpulency; Mr. Banting's Pamphlet; Dr. Cullen's First Lives; and Philosophical Transactions.

CORPUS CHRISTI, or CORPUS DOMINI JESU CHRISTI, means the consecrated host at the Lord's supper, which, according to the doctrines of the Catholic Church, is changed, by the act of consecration, into the real body of Jesus the Saviour. This doctrine, which was prevalent even in the twelfth century, caused the adoration of the consecrated host, which, as it was thought, should be worshipped as the true body of Jesus. On that account the people in the Catholic churches fall upon their knees whenever the priest raises the host.

The Catholic Church has ordained for the consecrated host a particular festival, called the *Corpus Christi feast*. It owes its origin to the vision of a nun of Liège, named *Juliana*, in 1230, who, while looking at the full moon, saw a gap in its orb, and, by a peculiar revelation from heaven, learned that the moon represented the Christian church, and the gap the want of a certain festival—that of the adoration of the body of Christ in the consecrated host—which she was to begin to celebrate and announce to the world! On this account the Archdeacon James (afterwards Pope Urban IV.) went to Liège in order to ordain such a festival; and he was confirmed in his purpose by a miracle. In 1264, while a priest at Bologna, who did not believe in the change of the bread into the body of Christ, was going through the ceremony of the benediction in his presence, drops of blood fell upon his surplice, and when he endeavoured to conceal them in the folds of his garment, formed bloody images of the host. The bloody surplice is still shown as a relic at Civita Vecchia. This circumstance forms the subject of one of the beautiful pictures of Raphael, in the Stanze di Rafaello. Urban IV. published in the same year a bull, in which he appointed the Thursday of the week after Pentecost for the celebration of the Corpus Christi festival throughout Christendom, and promised absolution for a period of from forty to 100 days to the penitent who took part in it. Since then this festival has been kept as one of the greatest of the Catholic Church. Splendid processions form an essential part of it. The children belonging to the choir, with flags, and the priests with lighted tapers, move through the streets in front of the priest, who carries the host in a precious box, where it can be seen under a canopy held by four laymen of rank. A crowd of the common people closes the procession. In Spain it was customary for people of distinction to send their children dressed as angels to join the procession; the different fraternities carried their patron saints, carved out of wood and highly adorned, before

the host; astonishment and awe were produced, as well as feelings of devotion, by the splendour and magnificence of the procession, by the brilliant appearance of the streamers, by the clouds of smoke from the censers, and the solemn sound of the music. The festival was also a general holiday, in which bull-fights, games, dances, and other amusements were not wanting. The festival is kept with more simplicity and dignity by the German Catholics. In France it is known as the *Fête-Dieu*. In Protestant countries the Catholics merely go round the churches in processions, and celebrate their worship with peculiar solemnities.

CORPUS CHRISTI COLLEGE, CAMBRIDGE, was founded about 1362 by the united guilds of Corpus Christi and the Blessed Virgin, two fraternities of townspeople which used to meet for prayers at St. Benedict Church and St. Mary's respectively. The endowments of the college were considerably increased by Archbishop Parker, who also bequeathed to it his valuable collection of manuscripts. There are numerous scholarships, some of considerable value, competed for by the students at the annual examinations. There are twelve fellowships, the holders of which must all take holy orders. The number of students attending the college ranges between 300 and 400.

CORPUS CHRISTI COLLEGE, OXFORD, a college founded by Richard Fox, bishop of Winchester, under a licence from Henry VIII. in 1506. The foundation consisted of twenty fellows and twenty scholars; the fellows were to be elected from the scholars, and the scholars drawn from certain counties. The number of fellowships and scholarships remains unaltered, but there is no restriction as to localities from which the scholars are to be elected. The fellowships are worth rather more than £200 a year, the scholarships about £80 a year, tenable for five years. The number of members on the boards amounts at times to about 500.

CORPUSCULAR THEORY OF LIGHT, the older theory, which explained the phenomena of light by supposing that a luminous body emits excessively minute particles of matter, corpuscules, as they were called, which striking the eye produce the sensation of light. In order to account for reflection, refraction, and polarization of light, these corpuscules were supposed to be endued with certain mechanical properties. The theory is completely displaced by the *undulatory theory*. Newton held the corpuscular theory, and supported it with great ingenuity. An account of the long and interesting controversy that was carried on with respect to the truth of these theories, and which engaged, some on one side and some on the other, all the most illustrious mathematicians and naturalists of Europe, from the time of Newton almost till our own day, will be found under UNDULATORY THEORY OF LIGHT.

CORPUS DELICTI (literally the *body of the crime or offence*). It is a figurative expression, used to denote those external marks, facts, or circumstances which accompany a crime, and without the proof of which the crime is not supposed to be established. We have no correspondent expression in English, and the term is peculiar to the civil law of continental Europe. We should say that certain proofs are indispensable to establish a crime, and that unless they exist, there is no legal ground to convict the party; so that *corpus delicti* is equivalent to the proofs essential to establish a crime.

The following observations have reference to the jurisprudence of Germany. The marks of guilt, which constitute the *corpus delicti*, are in many cases perceptible in the traces remaining (*facta permanentia*); for instance, the wounds inflicted upon a man; a lampoon posted up; written or printed words; counterfeit writings: in other cases such traces exist only in the memory (*facta transeuntia*); as words merely spoken, &c. A criminal trial must always rest upon a *corpus delicti* clearly substantiated. Unless the death of a man is fully proved, and shown to have been occasioned by the co-operation of another, no sentence of homicide can be passed. An inspection of the body in case of murder, or the statement of the injured party in less heinous offences, confirmed with an oath, &c., is accordingly the first condition of a criminal process. Entire deficiency of the *corpus delicti* can be supplied by no confession; and the latter remains without any effect; as, for instance, if a person should accuse himself of having stolen something from another, or of having killed some one, and no person could be found from whom such a thing had been stolen, or who had been killed. In the cases where the *corpus delicti* cannot be discovered by means of immediate examination, because the doer has destroyed all traces of it (for instance by a total burning of the corpse of a murdered person), other circumstances must be sought for which can afford certain proof of the crime; and without them punishment cannot be legally pronounced by the court. It must further be ascertained, in a case of murder, that death has ensued in consequence of the wound; or, rather, that the wound inflicted was, in itself, a sufficient cause for the death. In this respect the courts in Germany often go too far, by seeking for the most remote possibility by which the *corpus delicti* may be rendered uncertain. No reliance ought, in most cases, to be placed upon the circumstance that several persons pretend to have seen the corpse of the individual believed to have been murdered, until the corpse has actually been discovered, or until infallible evidence of the murder has been adduced. In crimes which leave no traces, the whole possible proof rests on witnesses and confessions. Even a confession of guilt by an accused party must be supported by other circumstances; for example, actions which have been observed by other persons, and which have a bearing on the crime, and render it probable. In the investigation of the *corpus delicti*, in a great many cases, the science of medicine must assist the law. Nevertheless, great uncertainty often remains after all the aid which can be thus attained; for instance, in poisonings, and in cases where the point in question is whether an infant was born alive or not. Frequently questions are proposed to the physicians which they cannot answer at all. In such cases nothing is required of them but the declaration that nothing can be said with certainty. It is a very important question whether preference ought to be given to the testimony of the physician who has attended the deceased till his death, or to the opinion of the physician of the court at the official examination. In a famous case in Germany the inquest found traces of poisoning by arsenic, though not the arsenic itself, whilst the physician attending during the last illness of the deceased asserted that no symptoms of poisoning had shown itself, and that the disease had taken a natural course. In another case the physician declared that the deceased had died of the lock-jaw, occasioned by a wound, whilst the legal examiners maintained that the wound had been without influence upon his death.

CORPUS JURIS (*body of law*) is a name given to certain collections of laws and legal treaties. The name of Corpus Juris Civilis in particular was bestowed in the twelfth century upon the general body of legal works drawn up at the orders of Justinian, viz. the Institutes, Pandects, Code and Novels; together with the collections bearing on the feudal law appended to them. Some scholars have attempted

to add the later edicts of the Romano-German emperors to the Corpus Juris Civilis. This, however, is not acknowledged, and the Corpus Juris Civilis has been, since the time of Accursius, considered as completed. Those parts, even of the Justinian collection of laws which were brought by early commentators within the circle of their critical examinations, have not acquired in the European courts of judicature any legal authority, although they have been since received into the entire collection of the Roman law. With the canonical or Papal laws the same mode of proceeding has been adopted. From the old resolves of the councils, and the Papal decrees, genuine and spurious, Gratian, in the middle of the twelfth century, collected his Concordantia Discordantium Canonum, afterwards called the *Decretum*. In the thirteenth century a collection of still later Papal decisions or decretals, in five books (compiled by order of Gregory IX., by Raymond of Pennafort in 1234), was added. These decretals were considered as supplementary and additional, and were therefore described and cited by the name of *extra*. Boniface VIII. (1298) allowed the addition of a sixth book. Clement V. added the decrees of the ecclesiastical council of Vienne (1311) under the name of the *Clementines*, or the seventh book of decretals, which completed the Corpus Juris Canonici, although Pope John XXII., about 1340, and a learned individual, about 1488, collected further decretals of the popes, which were added as supplements under the name of the *Extravagantes*. The name of Corpus Juris has also been given to many other codes and private collections of laws. There is a Corpus Juris Germanici Antiqui, by Georgisch; a Corpus Juris Feudalis; a Corpus Juris Germanici, &c. An edition of the Corpus Juris Civilis which may correspond to the improvements of the age and the progress of knowledge, has for a long time been a desideratum, but a very convenient edition for ordinary use was published by Beck in two volumes (Leipzig, 1825–37). A German translation, undertaken by Otto, Bruno Schilling, and Sintenis, appeared in seven volumes (Leipzig, 1830–33; second edition, 1839).

CORRECTION OF THE PRESS. The first impression taken from the types from which a book is to be printed is called a *proof*, and almost always contains some errors. If the person who corrects these does not understand the various signs used by the printers, he is liable to have his meaning mistaken; and some of the errors which occur in books are to be referred to this source. The most important signs used in correcting proofs are those which follow:—When a wrong word or letter occurs, a line is drawn through it, and the proper word or letter written on the margin opposite the line in which the error occurs. If a clause, word, or letter is omitted, a caret (∧) is marked at the place, and the omission is written on the margin. If a superfluous letter or word occurs, the pen is drawn through it, and the character ⁊, signifying *dele* (take out), written in the margin. Where words are improperly joined, a caret is written at the place where the separation should be made, and the mark # written in the margin. When syllables or words are improperly separated, they are joined by horizontal parentheses, as, du ty. These parentheses are to be made in the margin as well as at the break. When words are transposed, they are to be connected by a curved line, as (not is) when set up for 'is not,' and the mark *tr.* (transpose) is to be written in the margin. When a letter is turned, a line is drawn under it, and the mark ⁊ made in the margin. When punctuation is omitted, or requires to be altered, a caret is put at the place, and the comma or period, &c., is placed in the margin, with a stroke behind it, as, ,/ If a mark of quotation or superior letter has been omitted, the caret is made as before, and a mark of this sort ⁶/, ⁹/, or ⁶⁶/ placed in the margin. Words which are to be printed in italics are marked beneath with a single line; as, office (*office*): if in small capitals, with two lines, as Greece (GREECE): if in full capitals, with three, as James (JAMES). Where these marks are used in correction, the abbreviations *ital.*, *small caps.*, or *caps.* should be written in the margin. Where a word printed in italics is to be altered to roman letters, a line is to be drawn under it, and the word *rom.* written in the margin. Where a corrector, after altering a word, changes his mind, and prefers to let it stand, dots are placed under the word in the proof, and the word *stet* (let it stand) written in the margin. When a hyphen or dash is omitted, a caret is made under the place where it should be, and the mark -/ or —/ placed in the margin. When two paragraphs are desired to be joined, the end of the one and the beginning of the other paragraph are connected by a curved line ⁔, and the words *run on* written in the margin. Where a new paragraph is desired to be made, the mark [is inserted at the place, and the word *par.* written in the margin. Where blemishes, such as crooked lines, &c., appear, it is sufficient to call the printer's attention by a dash of the pen to the place. The corrections should always be written on the margin of the proof, so as to insure notice by the printer; and when these are numerous or intricate, it is advisable to connect them by a line drawn from the place where they are to be made. Persons correcting for the press should recollect that no considerable amount of matter can be inserted into or taken from a page, without requiring the whole page of types to be altered; and this alteration must be adjusted at the expense of the next page, and so on; so that all the following pages may have to be disturbed. It is therefore very desirable, when an addition or erasure is made amounting to more than a few words, to strike out or add something of about equal length near to the place; so as to avoid the troublesome and expensive process of 'over-running' the types.

In the early times of the art of printing more attention was paid than at present to the correction of the press, the books then printed being comparatively few and important, and superintended by learned men in their progress through the press; while in modern times innumerable publications of temporary interest are sent forth in great haste. Some of the old presses are celebrated for great correctness, and the works which have issued from them, therefore, are held in high esteem; for example, the publications of the Alduses, several of which were corrected by Erasmus, of the Stephenses, &c. It was not uncommon in those times for the proof-sheets to be hung up in some public place, and a reward offered to anybody who detected a typographical error. From this custom the proof-sheets are still called, in German, *aushängebogen* (sheets hung out). Some modern presses have been distinguished; and in the case of particular works, consisting wholly or in part of tables of figures, or of arithmetical calculations, a reward has been offered for every error discovered. In the preface to Vega's logarithmic tables two louis d'or are offered for every erratum detected. On the whole, however, more attention has been paid in modern times to elegance than to correctness of execution. Some of the English newspapers deserve much credit for their correctness, considering the rapidity

with which much of their contents is printed, as in the case of parliamentary speeches, delivered late at night, perhaps after midnight, and given to the public early the next morning.

CORREGGIO, ANTONIO ALLEGRI, frequently called *Antonio da Correggio*, from the place of his birth, was born, in 1494, at Correggio, in the duchy of Modena, and was intended for a learned profession; but nature had designed him for an artist. It has not been ascertained how much he was indebted to his first instructor, who was probably his uncle Lorenzo Allegri. His genius pointed out to him the way to immortality. It is related that once, after having seen the St. Cecilia of the great Raphael, which was placed in the church of San Giovanni, in Monte, at Bologna, he exclaimed, *Anch' io son pittore* (I also am a painter); but it is not proved that Correggio ever was in Bologna; and in Parma and Modena, where according to D'Argensville, he might have seen works of Raphael, there were none at that time; so that this story wants confirmation. That Correggio, without having seen either the works of the ancient masters, or the *chefs-d'œuvre* of the moderns who preceded him, should have become a model for his successors, by the unassisted energies of his genius, renders him so much the more deserving of our admiration. Three qualities will always be admired in him—grace, harmony, and a skilful management of the pencil. There is a peculiar grace in the movements of his figures, and a loveliness in their expression, which takes possession of the soul. These attitudes and movements could not be executed by any artist without his masterly skill in foreshortening, which not only gives greater variety to a piece, but is also favourable to gracefulness. Avoiding all roughness and hardness, Correggio delights us by mild and almost effeminate beauties. He strove to obtain this object also by harmony of colouring, of which he may be called the creator. He is unrivalled in the *chiaroscuro;* that is, in the disposition of the light and shade, in the grace and rounding of his figures, and in the faculty of giving them the appearance of advancing and retiring, which is the distinguishing excellence of the Lombard school, of which he may be considered the head. In his drapery, he calculated with extreme accuracy all the effects of the *chiaroscuro*. He possessed the power of passing, by the most graceful transition, from the bright colours to the half tints. It was ever his object to make the principal figure prominent, that the eye, after gazing till it was satisfied on the bright colours, might repose with pleasure on the softer masses. He made a skilful use of this art in his Night (*la Notte*), which is to be seen in the gallery in Dresden, where there are seven pictures in which his progress in the art may be recognized. Among his best pictures, besides the Night, are the St. Jerome, which has kindled the admiration of several distinguished painters to such a degree as to render them unjust towards Raphael; the Penitent Magdalene; the altar-pieces of St. Francis, St. George, and St. Sebastian; Christ in the Garden of Olives; Cupid; the fresco painting in Parma; and above all, the paintings on the ceiling of the cathedral in the same city. He died in 1534. The story of his extreme poverty, and of his death in consequence of it, has been long since disproved, yet Oehlenschläger has made it the subject of one of his best tragedies in German and Danish.

CORREGIDOR, in Spain and Portugal, a magistrate; a police judge with appellate jurisdiction.

CORRELATION OF THE PHYSICAL FORCES, a term introduced by Mr. Grove to denote what may more properly be called the convertibility of the various forms of energy. One or two illustrations will suffice to explain the doctrine. The energy that a bullet in rapid motion possesses may be converted into heat; for example, when a bullet strikes a target it is found to be warm to the touch. Heat may again be converted into *kinetic energy*, that is, the form of energy possessed by a moving body; for instance, through the intermediation of a steam-engine. Chemical action, another form of energy, may give rise to heat, as when gunpowder is burned; or to both heat and the kinetic energy, as when the powder is used to fire off a bullet from the gun; and it is to be noticed that if the same quantity of powder were employed in the two cases, there would be less heat obtained in the second case by an amount that corresponds to that used up in imparting the energy of motion to the bullet. Heat is directly converted into electricity, and electricity into heat. Electricity in motion produces magnetic effects, while magnets in motion are capable of giving us electricity. The energy of electricity in motion gives rise to chemical action; and chemical action properly applied keeps up an electric current. In connection with this doctrine that of the conservation of energy ought also to be studied.

CORRÈZE, an inland department, France, between lat. 44° 54′ and 43° 44′ N., and lon. 1° 12′ and 2° 29′ E., having N. department Creuse; N.E., Puy-de-Dôme; E., Cantal; S., Lot; W., Dordogne; and N.W., Haute-Vienne. It was formed from part of the former province of Limousin, and derives its name from the river Corrèze, by which it is traversed; area, 2218 square miles; capital, Tulle. It belongs almost entirely to the basin of the Garonne, and is watered by the Dordogne and its affluents. Surface mountainous, especially to the north and east. The north part is traversed by an offshoot from the mountains of Auvergne, which separates the basins of the Garonne and Loire. The culminating point is Mount Odouze, 3200 feet high. Soil far from fertile, except in a few of the valleys. Heaths occupy a great extent of surface, and agriculture is in a very backward state. The wine is of poor quality. Hay is abundant, and large crops of beet-root are grown, besides maize, barley, hemp, flax, &c., in moderate quantities. Minerals:—iron, coal, slates, mill and grind stones, granite, lime, and pottery clay, but they are little attended to; so that, with the exception of the ironworks, which employ about 100 workmen, the only manufacture of note is that of fire-arms at Tulle, employing about 1000 hands. The trade is principally in wine, wood, nut-oil, bees'-wax, horses, cattle, leather, straw-paper, iron, &c. A peculiar custom prevails here, contrary to the general law of France, of endowing the eldest son with a fourth of the paternal property over and above his fractional share, giving rise, as might be anticipated, to innumerable family broils. The department is divided into 3 arrondissements, 29 cantons, and 286 communes. It forms the diocese of Tulle. Pop. 310,843.

CORRIB, LOUGH, a large lake, the second in size in Ireland, county Galway, about 23 miles in length, and varying from 2 to 6 miles in breadth, and composed of two expansions, united by a narrow channel, about ½ mile wide at its narrowest part, across which is a ferry. It is about 3 miles distant from the sea at Galway, where it is only 14 feet above sea level. It is separated from Loch Mask by a narrow isthmus, through which there is a subterranean channel. It has about 40 miles of navigation, and its numerous islands contain nearly 1000 acres of land.

CORRIDOR (Italian and Spanish), in architecture, a gallery or long aisle leading to several chambers at a distance from each other, sometimes wholly inclosed, sometimes open on one side. In fortification, *corridor* signifies the same as *covert-way* (which see).

CORRIENTES, a province and town, La Plata. The province, between lat. 27° and 31° S.; lon. 55° and 60° W. (including Missiones), is bounded E. by the Uruguay, S. by Entre Rios, W. and N. by the Paranà, which separates it from Paraguay. In the south it is well wooded and fertile, while in the north it is marshy. The natural productions of the soil are similar to those of Brazil, and consist of cotton, tobacco, rice, sugar, indigo, &c. Pop. 129,023. The town, capital of the province, is agreeably situated, on elevated ground, left bank Paranà, near its confluence with the Paraguay; lat. 27° 28′ S.; lon. 58° 44′ W.; 390 miles N. Buenos Ayres. Its houses, chiefly of one story, and all supplied with galleries to protect from sun and rain, form irregular, unpaved streets, many of which have a slope to the river. The line of houses facing the river forms an exception to the general irregularity. There are two squares, one in the middle of the town, in which are the public buildings; and the other outside, used as a market-place. There are four churches; the cabildo, in which the representatives meet, and a college, founded by the Jesuits. Corrientes is well placed to serve as an entrepôt of goods, between the upper parts of the Paraguay and the Paranà, and the seaports at the mouth of the La Plata. Pop. 10,546.

CORROSIVES (from *corrodere*, to eat away), in surgery, are medicines which corrode whatever part of the body they are applied to; such are glacial acetic acid, burned alum, white precipitate of mercury, white vitriol, red precipitate of mercury, butter of antimony, lapis infernalis, &c.

CORROSIVE SUBLIMATE. See MERCURY.

CORRUGATED IRON, sheet iron strengthened by being bent into furrows parallel to the longest side of the sheet. It is largely used for roofing, and when prevented from oxidation by being dipped in melted zinc, is commonly known as galvanized iron. From the strength and lightness of which it can be made, it has been proposed as a suitable material for boats.

CORRUPTION OF BLOOD. See ATTAINDER.

CORRUPT PRACTICES ACT. See ELECTIONS.

CORRYVRECKAN, a noted gulf and whirlpool. west coast of Scotland, between the islands of Jura and Scarba. The breadth of the gulf is about 1 mile, and at certain times of the tide, and in high winds, the water rushes through it with great velocity and noise, and at such times there would be danger in attempting the passage with small vessels; but in general it is not at all so perilous as the appalling sights and sounds would indicate, the latter having invested it with terrors which it really does not possess.

CORSAIRS (Italian, *corsaro*), the Anglicized form of the term used in the south of Europe to denote those pirates who sailed from Algiers, Tunis, Tripoli, and the ports of Morocco. Lord Byron's Corsair, it is well known, derives its name from the character of the hero.

CORSELET (French); 1st, a little cuirass or armour to protect the body from injury, worn for merly by pikemen. It was generally of leather, and pistol proof. In England it was enacted (1588) that all persons having estates of a thousand pounds or upwards, should, along with other descriptions of armour, keep forty corselets.—2d, The part of a winged insect which answers to the breast of other animals.

CORSET, an article of dress, especially intended to preserve or display the beauties of the female form. To prevent the form from too early showing the inroads of time; to guard it from slight inelegancies, resulting from improper position, or the character of exterior drapery; to secure the beauteous proportions of the bust from compression or displacement; and at once agreeably to display the general contour of the figure, without impeding the gracefulness of its motions, or the gentle undulations caused by natural respiration, are the legitimate objects of the corset. For this purpose it should be composed of the smoothest and most elastic materials, should be accurately adapted to the individual wearer, so that no point may receive undue pressure, and should never be drawn so tight as to interfere with perfectly free breathing, or with graceful attitudes and movements. It is obvious that such corsets should be entirely destitute of those barbarous innovations of steel and whalebone, which, by causing disease, have thrown them into disrepute, and which, under no circumstances, can add to the value of the instrument when worn by a well-formed individual. Such hurtful appliances were first resorted to by the ugly, deformed, or diseased, who, having no natural pretensions to figure, pleased themselves with the hope of being able, by main strength, exerted upon steel-ribbed, whaleboned, and padded corsets, to squeeze themselves into delicate proportions. If, however, it be remembered that the use of corsets is to preserve and display a fine figure, not to *make one*, and that they are to be secondary to a judicious course of diet and exercise, it will be readily perceived that such injurious agents are utterly uncalled for in their composition. By selecting a material proportioned, in its thickness and elasticity, to the size, age, &c., of the wearer, and by a proper employment of quilting and wadding, it may be made of any proper or allowable degree of stiffness. If it be then accurately fitted to the shape of the individual, and laced no tighter than to apply it comfortably, all the advantages of the corset may be fully obtained. But such, unfortunately, is not the course always pursued. Ladies purchase corsets of the most fashionable makers, and of the most fashionable patterns and materials, regardless of the peculiarities of their own figures, which may require a construction and material of very different description. Hence it often happens that females, naturally endowed with fine forms, wear corsets designed for such as are disproportionately thick or thin, and destroy the graceful ease of their movements, by hedging themselves in the steel and whalebone originally intended to reduce the superabundant corpulence of some luxurious dowager. As no two human figures are precisely alike, it is absolutely requisite that the corset should be suited with the minutest accuracy to the wearer; and a naturally good figure cannot derive advantage from any corset but one constructed and adapted in the manner above indicated. Slight irregularities or defects may be remedied or rendered inconspicuous, by judicious application of wadding, or by interposing an additional thickness of the cloth. But it should be remembered that certain changes occur to the female frame, after the cares of maternity have commenced, which are absolutely unavoidable. Among these, the general enlargement or filling up of the figure is the most observable, but it is never productive of inelegance unless it take place very disproportionately. The undue enlargement of the bust and waist is most dreaded, and the attempt to restrain their development by absolute force has led to the most pernicious abuse of the corset. There is no doubt but that a judiciously fitted corset, whose object should be to support, and gently compress, might, in such cases, be advantageously worn; but, at the same time, it must be thoroughly understood, that the corset can only be really beneficial when combined with a proper attention to diet and exercise. Thus many ladies, who dread the disfigurement produced by obesity, and constantly wear the

most unyielding and uncomfortable corsets, lead an entirely inactive life, and indulge in rich and luxurious food. Under such circumstances it is vain to hope that beauty of figure can be maintained by corsets, or that they can effect any other purpose than that of cramping and restraining the movements, and causing discomfort to the wearer. On the other hand, proper exercise, and abstinence from all but the simplest food, would enable the corset to perform its part to the greatest advantage.

There is another error in relation to corsets as prejudicial as it is general, and calling for the serious attention of all those concerned in the education of young ladies. This error is the belief that girls just approaching their majority should be constantly kept under the influence of corsets in order to form their figures. They are therefore subjected to a discipline of strict lacing at a period when, of all others, its tendency is to produce the most extensive mischief. At this time all the organs of the body are in a state of energetic augmentation; and interference with the proper expansion of any one set is productive of permanent injury to the whole. So far from making a fine form the tendency is directly the reverse, since the restraint of the corsets detrimentally interferes with the perfection of the frame. The muscles, being compressed and held inactive, neither acquire their due size nor strength; and a stiff, awkward carriage, with a thin, flat, ungraceful, inelegant person, is the too frequent result of such injudicious treatment. It has been estimated that out of 100 women who wore the strong corset not yet entirely discarded, twenty-five succumbed to chest diseases, fifteen died in giving birth to their first child, thirty became infirm or deformed after the accouchement; only thirty being able to resist for a long time the evil effects of tight-lacing, but even these thirty or their progeny sooner or later suffered from this violation of natural law. The corset of a girl from her twelfth or fifteenth year till her twenty-first, should be nothing more than a cotton jacket, made so as rather to brace her shoulders back, but without improper compression of the arm-pits, and devoid of all stiffening but what is proper to the material of which it is made. At this age slight imperfections of form or inelegances of movement are especially within the control of well-directed exercise and appropriate diet: force is utterly unavailing, and can have no other tendency than that of causing injury.

We may conclude what we have to say on the use of the corset by embodying the whole in a few plain general rules:—1st. Corsets should be made of smooth, soft, elastic materials. 2d. They should be accurately fitted and modified to suit the peculiarities of figure of each wearer. 3d. No other stiffening should be used but that of quilting or padding; the bones, steel, &c., should be left to the deformed or diseased, for whom they were originally intended. 4th. Corsets should never be drawn so tight as to impede regular natural breathing, as under all circumstances the improvement of figure is insufficient to compensate for the air of awkward restraint caused by such lacing. 5th. They should never be worn, either loosely or tightly, during the hours appropriated to sleep, as by impeding respiration and accumulating the heat of the system improperly they invariably injure. 6th. The corset for young persons should be of the simplest character, and worn in the lightest and easiest manner, allowing their lungs full play, and giving the form its fullest opportunity for expansion. It is but fair to state, however, that an improvement has of late years taken place. The busk (if there is any at all) is made of the thinnest possible slip of steel, and the whalebones are considerably reduced in thickness.

At this remote period it is impossible for us to say whether the corset in some form might not have belonged to the complex toilet of the ancient Israelitish ladies. We find the prophet Isaiah, in ch. iii., inveighing against their numerous and useless decorations—'the bravery of their tinkling ornaments about their feet, and their cauls, and their round tires like the moon, the chains, and the bracelets, and the mufflers, the bonnets, and the ornaments of the legs, and the head-bands, and the tablets, and the ear-rings, the rings and nose-jewels, the changeable suits of apparel, and the mantles, and the wimples, and the crisping-pins, the glasses, and the fine linen, and the hoods, and the vails.' This catalogue at least shows that the disposition evinced by the fair sex to adorn their persons, and render them more attractive, is not of modern origin, but most probably originated with our great mother Eve. The earliest and most delightful record we have of a contrivance like the corset is Homer's account of the girdle or cestus (see CESTUS) of Venus which even the haughty Juno is fabled to have borrowed in order to make a more profound impression upon her rather unmanageable husband, Jupiter. This, we are persuaded, was nothing but such a corset as we have described in the beginning, worn by an elegant form, to which it was accurately adapted. Even Venus herself could not look otherwise than awkward and repulsive in one of the armadillo, shell-like machines, which are sold as fashionable, without regard to their inelegance. The costume of the ancient Greek ladies was in every particular opposed to stiffness or personal restraint; and we find that the cestus, or girdle, to gather the flowing redundance of their robes around the waist was considered sufficient for the display of their enchanting forms. The Roman ladies were great adepts in the mysteries of the toilet, though not possessed of the grace and elegance of the Grecian beauties. We find among them rudiments of the corset in the bandages which they wore around the chest for the purpose of preserving the shape of the bosom and displaying it to advantage. They were commonly made of woollen or linen cloth, and are alluded to in several instances by the poets. Thus in Terence we find Chærea saying to his servant concerning an unknown beauty who attracted his attention—'This girl has nothing in common with ours, whom their mothers force to stoop and make them bind their bosoms with bandages in order to appear more slender.'

A writer in the French Dictionary of Medical Sciences, in an article on corsets, which the reader may compare with the present, states that the whalebone corset, dividing the female form into two parts, is a relic of the ancient German costume, which is still to be seen in some pictures of celebrated masters. We are not, however, prepared to retract our opinion that such contrivances were first resorted to in cases of deformity; for, on inquiry, we find that the German females as described by the Roman writers wore dresses tight to the person, though no mention is made of artificial contrivances to give it a peculiar form. The dress of both sexes was similar, consisting of a *sagum* or cloak clasped at the throat, and a vest or tunic which fitted tightly and showed all the form. It might prove interesting to inquire into the influence which the costume of the mailed knights, during the age of chivalry, had upon female dress, and whether much of the disposition to display the entire figure, as far as possible, did not arise from this display constantly made by the male sex in their closely-fitting armour. It would lead us too far, however, to engage in such an examination here; neither shall we copy M. de Jouy's account of the thoracic corset of the Bayaderes of India, which he

incorrectly states to be a finely woven net of bark, closely fitted to the bust, and never laid aside; whereas it is always of cotton or silk, and is laid aside like that of other females.

CORSICA (French, *Corse*), an island, in the Mediterranean, forming the French department of same name. It is separated from the island of Sardinia, on the south, by the Strait of Bonifacio, about 10 miles wide, and its shortest distance from the mainland, nearly from Cape Corse due east to the coast of Tuscany, is 50 miles. Its nearest distance from France is, north-west, about 100 miles. It is somewhat irregular in shape, but tolerably compact, except towards the north, where it terminates in a long and narrow tongue of land about 22 miles long by about 6 miles broad. Greatest length, N. to S., 110 miles; greatest breadth, near its centre, 53 miles; area, 3377 square miles. The east coast is remarkable for its uniformity, presenting a line which is broken in only one or two places by comparatively small indentations. To this the west coast presents a striking contrast, a number of deep bays following each other in rapid and almost uninterrupted succession. Of these the most important, proceeding north to south, are the Gulfs of St. Fiorenzo, Calvi, Porto, Liscia, Ajaccio, and Valinco. The interior is traversed by a mountain chain, which has its principal direction north to south, but throws out several lateral branches, particularly to the north-west. The culminating point, Monte Rotondo, near the centre of the island, has a height of 9054 feet, while several of the other summits considerably exceed 7000 feet, and the greater part of the year are covered with snow. The mountain masses are chiefly composed of granite and porphyry, and appear to be generally overlaid by extensive beds of limestone. From the east and west sides of the chain numerous streams descend to the opposite sides of the coast. They are mere torrents, short and rapid, and altogether unfit for navigation. The largest, both proceeding from the east slope, are the Golo and Tavignano. Along with the other torrents which take the same direction, they have accumulated large quantities of debris and alluvium, which, preventing the egress of the waters, have gradually formed on the east coast a long series of lagoons and morasses, and made that part of the island very unhealthy; but with this exception the climate is one of the finest in Europe. The heat is sometimes excessive, but the sky is generally clear, and the air bracing. The summits of its many lofty mountains are covered with pines, evergreen oaks, cork-trees, beeches, and chestnuts. In other parts the hillsides are overgrown with dense thickets of cistus, myrtles, arbutus, and other shrubs. Numerous valleys lie between the lofty ridges, and sometimes plains of considerable extent occur, the soil of which is generally fertile and well adapted for the growth of all the ordinary cereals. Agriculture is, however, in a backward state, and the island scarcely produces grain sufficient for local consumption. The construction of new roads, the draining of marshes and stagnant waters, especially upon the east coast, the greater facilities of communication with other countries, and the slow but steady increase of the population, are tending to a better state of things. But as yet large tracts of land remain uncultivated, and implements are of the rudest form. The lower sunny slopes are generally covered with vineyards; but owing probably more to mismanagement than to any defect in the soil, none of the wines produced have as yet attained a high name. The olive appears to be indigenous to the island, and is found growing luxuriantly in all parts of it. It also forms an important branch of regular culture, and is understood to yield very profitable returns. The mulberry, orange, and citron succeed well, particularly in the lower valleys near the coast; and it is thought that indigo, cotton, and sugar might be cultivated with success. One of the most valuable productions of the more elevated districts is the chestnut, on which, at least during the winter months, the poorer inhabitants principally subsist. Among domestic animals, the first place seems due to mules and goats. The former are finely formed, sure-footed, and hardy, and are almost the only animals employed for transport; the latter are of a large and handsome breed, and are kept in vast numbers. Both horses and cattle are indifferent; and the sheep, though remarkable for the delicacy of their flesh, are small in size, and yield inferior wool. The principal wild animals are the boar and the fox. The wolf is unknown. Deer are numerous in the forests, and all the smaller game and wild-fowl are common. Eagles, vultures, and numerous other birds of prey frequent the loftier mountain districts. In the rivers, in the lagoons, and along the coast, fish abound, and active fisheries are carried on. Corsica is not rich in minerals. Numerous metals exist in small quantities, and iron is worked to some extent; but the economical value of the whole is very limited. At present the principal source of mineral revenue is derived from quarries of fine granite, porphyry, and marble. Neither manufactures nor trade have made much progress. The chief exports are wine, brandy, olive-oil, chestnuts, fruit, and fish. The Corsicans are of middle size, and of a dark and somewhat bilious complexion. They are generally sober and hospitable, and have repeatedly given proofs of their boldness and love of independence. One of the darkest features in their character is a love of revenge.

From the Phœnicians, its first colonists, the island took the name of Cyrnos; and from the Romans that of Corsica. On the decline of the Roman Empire it was seized by the Goths, and passed from them to the Saracens. In 1481 it fell under the dominion of the Genoese, who retained it, with some interruption, till 1755, when a great part of it was wrested from them and made independent by the celebrated General Paoli. France, founding on a pretended cession by the Genoese, obtained forcible possession of it in 1768, after the inhabitants had distinguished themselves by a long and valiant resistance. At the time of the French revolution, Paoli, who had taken refuge in England, returned to his native land, and unfurling the banner of the death's head (the old Corsican arms), he summoned his countrymen to strike for their independence. With the assistance of the British, who landed 18th Feb. 1794, he reduced Bastia in May, and Calvi in August. Corsica was constituted a kingdom under the government of a viceroy (General Elliot); the constitution and laws of Britain were adopted, and a parliament such as Ireland had was established. But a large part of the people were averse to the British, whom they regarded as heretics, and the French party again appeared on the island in October, 1796, under General Gentili. Sickness had reduced considerably the effective force of the British, and their position was rendered still more critical by the French occupation of the neighbouring city of Leghorn, and in consequence they evacuated Corsica. Since 1811 the island has formed a French department. For administrative purposes the department is divided into five arrondissements—Ajaccio (the capital), Bastia, Calvi, Corte, and Sartene, subdivided into sixty-one cantons and 355 communes. The most distinguished individuals to whom Corsica has given birth are Paoli and Napoleon. Pop. 259,861.

CORSNED (Saxon, *corse*, a curse, and *snæde*, a bit or morsel), the morsel of execration; a piece of

bread consecrated by exorcism, to be swallowed by any person suspected of a crime. If guilty, it was expected that the swallower would fall into convulsion, or turn deadly pale, and that the bread would find no passage. If innocent, it was believed the morsel would turn to nourishment.

CORSO, an Italian term first applied to races of riderless horses, then to the long lines of gaily-decorated carriages driven through the principal streets of the cities, and afterwards to the most fashionable carriage-drive in the city. The Corso, at Rome, stretching from the Piazza del Popolo to the Capitol, and dividing the city into two equal parts, is nearly 3500 paces in length, and is inclosed by high and mostly splendid edifices; but its breadth is not proportionate; so that in most parts not above three carriages can go abreast. The higher class of citizens take the air in carriages, which form a very long row. This evening promenade, which in all large Italian cities is splendid, and is imitated in very small towns (although it may have only a few coaches), attracts great numbers of spectators on foot. The carnival is the gayest of the festivals, and at this time the Corso appears in its greatest splendour. (See Goethe's description of the Roman carnival and the Corso.)

CORT, CORNELIUS, a celebrated Dutch engraver and designer, born at Hoorn in 1536. In his youth he worked for Jerome Cock, a printseller at Antwerp. He then went to Venice, where he was warmly welcomed by Titian, some of whose pictures he was employed to engrave. Cort finally setted at Rome, and established a school of engraving there, and it is said had Agustino Caracci for a pupil. He died in 1578. He made the first engraving of the Transfiguration by Raphael, and about 150 prints from the other Italian and Flemish masters. This number, considering the shortness of the engraver's life (forty-two years), and the size and fine style of the plates, betokens a considerable amount of industry; but although he had a complete mastery of the graver, he is reproached with deficiency in discriminating delicate shades and relative distance, or the nice varieties of expression.

CORT, HENRY, the inventor of the processes of puddling and rolling iron, which have contributed so materially to extend the iron trade of Great Britain, was born at Lancaster in 1740. He commenced business as an iron merchant at Gosport, Hampshire, and afterwards erected iron-works at Fontley, near that town, where he expended large sums in experimenting for improvements in the process of manufacturing iron. These endeavours were very successful, and he obtained two patents for his inventions, which promised to secure to him the means of realizing a handsome fortune. But the unfortunate selection of a partner, an official under government, involved him in a complication of lawsuits, which ultimately effected his ruin, and compelled him to accept the subordinate office of manager of an iron establishment. In 1794, in consideration of the important services rendered by him, he received a pension of £200 a year from government. He died in 1800. The amount added by his inventions to the national wealth since the commencement of the present century is estimated at £600,000,000, while they have given employment to 6,000,000 persons.

CORTES. The cortes was the old assembly of the estates in Spain and Portugal. In Spain the cortes of Castile, which was composed of the higher nobility, the superior ecclesiastics, the knights of the orders of St. James, Calatrava, and Alcantara, and the representatives of certain cities, held the first rank during the time of the united Spanish monarchy. In early times the king was very dependent upon them; indeed, they were invested with the power of making war, and frequently exercised it in opposition to the throne. In the original constitution of Arragon the form of government was very remarkable, a supreme judge, called *el justizia*, selected from persons of the second class, presided over the administration of the government. He decided all questions and disputes between the king and his subjects, and confined the royal power within the constitutional limits. King Ferdinand of Arragon and Isabella of Castile succeeded in rendering themselves independent of the estates (*las cortes*); and afterwards, when the Castilians dared to resist an unconstitutional tax, at a meeting convoked at Toledo by Charles in 1538, the king abolished this assembly of the estates. After this neither the clergy nor nobility were assembled; deputies from eighteen cities were sometimes, however, convened, but this only in case subsidies were to be granted. Philip II. restrained the liberties of the Arragonese in 1591. After the Spanish war of Succession Philip V. deprived those provinces which had adhered to the Austrian party of the privileges that still remained to them. From that time the cortes were convened only to pay homage to the king or the Prince of Asturias, or when a question respecting the succession to the throne was to be determined. But when Napoleon attempted to extend his influence over Spain (see the articles FERDINAND VII. and SPAIN since 1808) he convoked (June 15, 1808) a junto of the cortes at Bayonne. In their last session (June 7, 1812), a new constitution was adopted by them. The ninth article regulated the powers and duties of the cortes, and provided that they should consist of twenty-five archbishops, twenty-five nobles, and 122 representatives of the people. Napoleon afterwards attempted, by offering to restore the cortes to their ancient importance, to gain over the Spanish nobility, and through them the people, but failed. (In regard to the new cortes in SPAIN and PORTUGAL, see those articles.) The Portuguese cortes is coeval with the monarchy. In 1143 the assembly at Lamego was asked to confirm the elevation of Alphonso I. to the throne, and replied: 'We resolve that he shall be king during his life, and his children after him.' The external prosperity of Portugal drew off the attention of the people from internal government, and the kings, elated with their victories, called the cortes very seldom together. In 1828 Don Miguel assembled the cortes, in order to be acknowledged by them, and to give his usurpation an appearance of legitimacy.

CORTEZ, FERNANDO, or HERNAN, the conqueror of Mexico, was born in 1485 at Medellin, in Estremadura, and went to the West Indies in 1504, where Velasquez, governor of Cuba, under whom he had greatly distinguished himself, gave him the command of a fleet, which was sent on a voyage of discovery. Cortez quitted Santiago de Cuba Nov. 18, 1518, with eleven vessels, about 700 Spaniards, eighteen horses, and ten small field-pieces. He landed on the Gulf of Mexico. The sight of the horses on which the Spaniards were mounted; the movable fortresses in which they had crossed the ocean; the iron which covered them; the noise of the cannon;—all these objects alarmed the natives; and the adventurer by his address gained over the Totonacs and Tlaxcalans, who were his faithful allies to the last. To keep in check another tribe he built a fort and a few houses, which formed the nucleus of the city of Vera Cruz, and in order to prevent the desertion of his soldiers, and to give them the courage of despair, he caused his little fleet to be destroyed. Cortez entered the town of Mexico November 18, 1519. Montezuma, the sovereign of the country, received him as his master; and the inhabitants, it is said, thought him

a god and a child of the Sun. He destroyed the idols in the temples, to whom human sacrifices were offered, and placed in their room images of the Virgin Mary and of the saints. In the meantime he made continual progress towards getting possession of the country, forming alliances with several caciques, enemies to Montezuma, and assuring himself of the others by force or stratagem. On a general of Montezuma attacking the Spaniards, in obedience to a secret order, Cortez repaired to the imperial palace, had the commander and his officers burned alive, and forced the emperor, while in chains, to acknowledge publicly the sovereignty of Charles V. The unhappy monarch added to this homage a present of a large quantity of pure gold, and a number of precious stones. But the jealousy of Velasquez was so much excited by the deeds of his representative, that he sent an army numbering about 1400 against him. Cortez, with a force not more than 250 strong, advanced to meet it, gained over the soldiers who bore arms against him, and with their assistance again made war with the Mexicans, who had also revolted against their own emperor, Montezuma, whom they accused of treachery. After Montezuma, who had hoped to restore tranquillity by showing himself to the multitude, had fallen a victim to their rage, Guatimozin, his nephew and son-in-law, was acknowledged as emperor by the Mexicans, and gained some advantage over the Spaniards. He defended his capital during three months, but could not withstand the Spanish artillery. Cortez again took possession of Mexico, and in 1521 the emperor, the empress, the ministers, and the whole court were in his power. The unhappy Guatimozin was subjected to horrid cruelties to make him disclose the place where his treasures were concealed, and was afterwards executed with a great number of his nobles. The court of Madrid now became jealous of the power of Cortez, who had been some time before appointed captain-general and governor of Mexico. Commissioners were sent to inspect and control his measures; his property was seized; his dependents were imprisoned, and he repaired to Spain. He was received with much distinction, and returned to Mexico with an increase of titles, but a diminution of power. A viceroy had charge of the civil administration, and Cortez was intrusted only with the military command and the privilege of prosecuting his discoveries. The division of powers proved a constant source of dissension; and though he discovered the peninsula of California in 1533, most of his enterprises were frustrated, his life imbittered, and he returned again to Spain, where he was coldly received and neglected. He followed Charles V. in his unfortunate expedition against Algiers in 1541 and gave signal proofs of his valour, yet the monarch continued to refuse him admission to the court. It is said that one day, having forced his way through a crowd round the carriage of his king, and put his foot on the step to obtain an audience, Charles coldly inquired who he was. 'I am a man,' replied Cortez, 'who has gained you more provinces than your father left you towns.' He passed the remainder of his days in solitude, and died, December, 1547, near Seville, in the sixty-second year of his age, leaving a character eminent for bravery and ability, but infamous for perfidy and cruelty.

CORTONA, a fortified town of Tuscany, contains seven churches (including the cathedral), twelve convents, and many interesting remains. Pop. 5050. It lies 52 miles S.E. Florence.

CORTONA, properly *Pietro Berretini*, a painter and architect, was born in 1596. He was commonly called *Pietro di Cortona*, from the name of his native town, Cortona in Tuscany. He acquired the first rudiments of his art under his father, Giovanni, who was also a painter and architect, and afterwards studied with Andreas Commodi and Baccio Ciarpi at Rome. At the commencement of his studies his awkwardness was so remarkable that his fellow-students called him *ass's head*. Nevertheless he devoted himself to the study of the antiques, and of the great masters, Raphael, Caravaggio, and Michael Angelo, and unexpectedly made his appearance as an artist with the Rape of the Sabines. The Birth of Christ, in the church of Our Lady of Loretto, established his reputation. His painting on the ceiling of the large saloon in the Barberini Palace, representing the Triumph of Honour, is a very happy effort. Mengs declares it one of the grandest compositions ever executed by a painter. He afterwards travelled through Lombardy, the Venetian States, and Tuscany, where he painted the ceilings of the Palazzo Pitti in Florence, and thence returned to Rome. During this journey he was constantly employed as a painter and architect. He was subsequently attacked by the gout, and being unable in consequence to ascend the scaffoldings, he employed himself in the execution of easel pictures, which, although of less value than his larger works, are held in great estimation: they are very rare. Alexander VII. made him a knight of the order of the Golden Spur, as a reward for the embellishment of the colonnade of the church Della Pace. He died in 1669, and obtained an honourable burial in the church dedicated to St. Luke at Rome, where he had immortalized himself by the design of the altar of St. Martina. Cortona sacrificed truth to pleasing effect. This object, however, he did not attain. The defects of his drawing, which is rather heavy, were redeemed by the fertility of invention, the attractive charms of his young female figures (although it is objected to them that they are too uniform), and the fresh colouring of his harmonious tints. This last quality is an excellence peculiar to him, and which no other artist has attained in an equal degree either before or since his time.

CORUNDUM, or CORINDON, sometimes called also, from its hardness and peculiar lustre, *adamantine spar*, is of a grayish, greenish tint, occasionally reddish; more rarely blue, yellow, and black. It is translucent or opaque. Its specific gravity varies from 3·975 to 4·161. In hardness it ranks next to the diamond. It is insoluble in acids, infusible by itself in the blowpipe flame, but gradually fuses when heated with a flux. It occurs crystallized in the form of the regular six-sided prism, and also in acute and obtuse hexahedral pyramids. It is also found granular and compact. It consists almost wholly of alumina, sometimes containing 4 or 5 per cent. of silica, lime, magnesia, and water. The blue variety, when transparent, goes by the name of the *sapphire;* the rose red or the violet, which is sometimes *chatoyant*, is called the *oriental ruby*. Both of these rank, as gems, next to the diamond. They are found in the sands of rivers, and among alluvial matter in Ceylon. The common corundum is found in a granite rock in India, at Mont St. Gothard, and in Piedmont. A granular variety of corundum, containing peroxide of iron, is called *emery*. It is found in the Island of Naxos in rolled masses at the foot of primitive mountains. Its powder is well known in commerce, and greatly valued as a polishing substance.

CORUNNA (Spanish *Coruña*), the *Magnus Portus* of the Romans, a sea-port of Spain, in the province of the same name, which forms part of the ancient province of Galicia, on the north-west coast, on a peninsula at the entrance of the Bay of Betanzos. The streets of the upper town are narrow and ill

paved. The lower town stands on a small tongue of land, and has tolerably broad and clean streets. There are considerable tobacco and glass manufactures, and some trade in cattle, flour, salt fish, vegetables, drugs, &c. The chief objects of interest are the royal arsenal, and an ancient tower, admired for its elevation and solidity. The harbour is spacious and secure, and is protected by two castles. About 3 miles from the harbour is a lighthouse, 92 feet high, called the Tower of Hercules, and supposed to be of Roman or Phœnician construction. In January, 1809, the British army was attacked at this place, previous to embarking, by the French under Marshal Soult. The French were gallantly repulsed, but the British lost their brave commander, Sir John Moore, who was interred on the evening of the action in the citadel of Corunna, where the enemy afterwards raised a monument to his memory. Pop. 30,132.

CORVÉE (French, from the Latin *cura viæ*, care of the road), the obligation of the inhabitants of a certain district to do certain labour for the feudal lord or the sovereign gratis or for pay. As the name shows, *corvée* originally meant compulsory labour on roads, bridges, &c., but it is applied also to other feudal services. Generally, of course, the payment for such services is much below the wages of ordinary labour. In some cases, however, the *corvées* have been considered as a privilege, and people have insisted on their right to perform the services and to receive the pay for them, as the tenth part for threshing, &c. In some parts of Germany they still exist. In Prussia they were abolished under Hardenberg's administration. In France the first revolution extirpated this relic of the feudal times.

CORVETTE (French), a vessel of war having a flush deck, three masts, and seldom carrying more than twenty-six guns.

CORVEY, a town in the Prussian province of Westphalia, 15 leagues south-east of Minden, famous in former times as *Corbeia Nova;* pop. 5800. Here is a Benedictine convent on the Weser, which, with the convent of Fulda, was one of the first centres of civilization in Germany. It was built in the sixth century. The history of this interesting convent is important with reference to the history of the civilization of the middle ages. Wittekind, the historiographer of the convent, Bruno, known afterwards as Pope Gregory IV., and many other learned men, were educated here. In 1514 the manuscript of the first five books of the Annals of Tacitus was discovered here, and was presented to Leo X. From Corvey proceeded Ansgar, 'the Apostle of the North.' In 1794 Corvey was made a bishopric. In 1802 the bishopric was abolished, and Corvey given to the Prince of Nassau and Orange; in 1807 it was assigned to Westphalia; in 1815 to Prussia; in 1822 it was made a mediatized principality (106 square miles, 10,000 inhabitants). The magnificent cathedral contains many monuments. In 1819 Paul Wigand published a history of the abbey of Corvey.

CORVIDÆ, an extensive group or family of birds belonging to the order Insessores or Perchers. The group, of which the crows may be taken as typical, is nearly allied to that containing the birds of paradise, especially resembling them in the metallic lustre of their plumage. The family is characterized by the strong bill, which is curved and sometimes hooked; the fifth primary of the short rounded wing is the longest; the tail-feathers are successively longer towards the centre, but the middle feathers are not prolonged beyond the rest as in the birds of paradise; the feet are strong. The East Indian and Javan sub-family *Glaucopinæ* includes *Dendrocitta vagabunda*, which was formerly ranked with the magpies, but has a shorter beak than they, and the tail-feathers overlap each other at the sides. The jays (*Garrulinæ*) are among the handsomest members of the family, and their beauty has been fatal to the common jay (*Garrulus glandarius*, Vieill.) in some parts of England, their wings being especially coveted for ladies' bonnets. It is of retired habits, and thus maintains its hold in some districts. The note of the jay is extremely harsh, and his habits render him an enemy to the gardener. The bill is straight and short, and the wings are relatively very short, the whole habit of body fitting the bird for arboreal life. The jay is an inhabitant of Europe and Asia. *Cyanocorax*, a nearly allied species, is Brazilian; Australia and New Guinea have several genera belonging to the sub-family *Phonygaminæ*, whose wings and tail are long, and the former are pointed. The *Fregilinæ* have a long slender bill, slightly curved like that of the hoopoes. The chough or red-legged crow (*Fregilus graculus*) is now disappearing from Britain, being confined chiefly to rocky situations near the coast. The red-legged crow is a very handsome lively bird, and its habits do not furnish any explanation of its slow disappearance, which is probably due to the encroachment of man on its more retired haunts. A handsome species (*F. dumonti*) has been found by Wallace in New Guinea. To this sub-family belongs *Podoces*, a Kirghis genus, and the choquard (*Pyrrhocorax*), the representative in the Alps and Apennines of the chough. The *Corvinæ* include the magpies (*Pica*), the nut-crackers (*Nucifraga*), the jackdaw (*Monedula*), and the crows (*Corvus*). The last-named birds are described under CROW. The magpie is one of the few members of this group which remain in pairs throughout the year. The long tail and the long rounded wings render this bird a very handsome object when flying. The diet of the magpie is as varied as that of the jay, but it is more addicted to animal food, and it even attacks weakly sheep and young game. The nut-cracker (*N. caryocatactes*), a comparatively rare bird in the north of Britain, is found in most parts of Europe. The Scandinavian birds are distinguished from those of England by a shorter and stouter bill; but it is doubtful if they should on that account be regarded as a distinct species.

CORYBANTES (*Curetes, Idæi Dactyli;* among the Romans, a peculiar order of priests called *Galli*) are said to have derived their origin from Corybas, son of Cybele and Jasion, who appointed them to perform religious service to his mother, the goddess Cybele, in the island of Crete and in Phrygia. According to much more ancient traditions, they were descendants of Vulcan. The story of their clashing together instruments of forged metal when Rhea gave them the infant Jupiter in order to prevent Saturn from hearing his cries seems to have some connection with this tradition. According to Apollodorus the Corybantes were sons of Apollo and Thalia; according to others of Apollo and Rhetia.

CORYMBUS, in ancient sculpture the wreath of ivy leaves, berries, or garlands with which vases were encircled. It is also applied to that style of dressing the hair among the Grecian women, in which it was tied in a knot on the top of the head.

CORYPHÆUS, the leader of the chorus in the ancient dramas. His functions, however, were often as wide as those of our stage manager, conductor, and ballet-master. The name is now applied to the leaders of the different parts in operatic choruses or the principal dancers in the corps de ballet. By extension it is also applied to those eminent in the arts or sciences.

CORYPHODON, a genus of extinct mammals found in European strata of Eocene age. They were of the bulk of the Tapir, to which they are closely allied. The molars were $\frac{7}{7}$, and the crowns are transversely ridged. *C. eocænus*, Owen, was found at Sheppey along with *Hyracotherium*, a hog-like animal, a crocodile (*C. toliapicus*), a water-snake, and the eggs of turtles; and as these are associated with vegetables of tropical type, no less than 13 species of *Nipa*, such as now border the Ganges, being recognized by their fruits, the picture suggested is that of a large river draining a tract of dry land lying to the west, and pouring its waters into the German Ocean, while its sediments, which Whitaker has shown come from the Welsh hills, were laid down as London clay and associated sands and gravels, amid which are entombed the remains of animals and of plants which lived on its banks, or flourished in the swamps of a region then subjected to a much warmer climate than now. It may be remarked that though the tapirs are now found both in Sumatra and South America, the Coryphodon is only found in Europe. The former genus is found fossil in the superficial accumulations of all the regions in which it now lives. The Coryphodon is found in the lower Eocene deposits, its greater antiquity agreeing with the more embryonic characters which its anatomy suggests.

COS, or Coos, an island in the Ægæan Sea (now *Stanchio* or *Stincho*), on the coast of Asia Minor, opposite the towns of Halicarnassus and Cnidos (95 square miles, 8000 inhabitants), the land of Apelles and Hippocrates. Here was a celebrated temple of Æsculapius. In Cos was manufactured a fine, semi-transparent kind of silk, much valued by the ancients. The modern town of Cos, which occupies the site of the ancient one, is a miserable place, yet the most important on the island. The harbour is now so filled up that vessels of the smallest size are unable to enter. The town is inhabited by the Turks, the straggling villages by the Greeks.

COSEL. See Kosel.

COSEL (or Cossell), Countess of, one of the many mistresses of the prodigal Augustus II., king of Poland and elector of Saxony. She was the wife of the Saxon minister Hoymb, who, well knowing the king's disposition, kept her far from court; but on one occasion, when excited by wine, he praised her so much to the king, that the latter ordered her to be brought to Dresden. She was soon divorced from Hoymb, and appeared at court as the Countess of Cosel, the mistress of the king. A palace was built for her, still called the *Cosel Palace*, which was pre-eminent for magnificence and luxury. The furniture alone cost about £30,000. It must be remembered that the king had no income from Poland; on the contrary, the royal dignity was a source of great expense to the elector; thus the little electorate had to support, unaided, the enormous extravagance of its ruler. For nine years the countess succeeded in preserving the king's favour, and exercised an arbitrary sway in affairs of government. At last she fell into disgrace, and was dismissed from the king's presence. She retired into Prussia, and was afterwards arrested at Halle, at the request of Augustus, and carried to Stolpen, in Saxony, where she remained imprisoned forty-five years, and died eighty years old. So much power had she over the king when in favour that dollars and florins were actually coined, bearing the royal arms in conjunction with those of the countess.

COSENZA (anciently *Cosentia*), a city of southern Italy, capital of province of Cosenza or Calabria Citeriore, situated on seven small hills, at the foot of the Apennines, where the Busento joins the Crati, 150 miles s.e. Naples; pop. 14,000. The metropolitan is the only church within the walls; but there are three parish churches in the suburbs. The environs are beautiful, populous, and well cultivated, producing abundance of corn, fruit, oil, wine, and silk. This town was anciently the capital of the Brutii, and a place of consequence in the second Punic war. In 410 a.d. Alaric, king of the Visigoths, died here, and was buried in the Busento. Cosenza has frequently suffered from earthquakes, particularly in the year 1638.

COSMAS, surnamed Indicopleustes (the Indian navigator), an Alexandrian merchant of the sixth century. He traded for a long time in Ethiopia, Arabia, and India, but consecrated his later years to the service of religion. He wrote several geographical and theological works, the most important of which extant is the Christian Topography. In this book are found many curious details respecting India and Ceylon, together with the first mention of the famous inscription of Adule. The author tries to prove that the earth is a parallelogram bounded by walls, which meet and form the vaulted roof which we call the sky. Near the north pole is a high mountain, round which revolve the sun, moon, and stars; the eclipses and phases of the moon are produced when the mountain is interposed between that luminary and the earth. This work was published in 1706 by Montfaucon, in his Collection des Pères et Écrivains Grecs, from a Greek manuscript of the tenth century.

COSMETICS (from *kosmeō*, I ornament, beautify), means for preserving or increasing the beauty of the human body. Every one knows that such means are used by the most savage as well as the most civilized nations; that cosmetics have afforded a rich harvest to charlatans; and that the most innocuous of them are objectionable, as they clog up the pores of the skin, and so prevent it from performing its natural functions. It cannot be too strongly impressed upon the vain of both sexes that if pure water, out-door exercise, and temperate living will not give them pure and healthy skins, *nothing* else will.

COSMOGONY (from the Greek *kosmos*, the world, and *gonos*, generation), according to its etymology, should be defined the origin of the world itself; but the term has become, to a great degree, associated with the numerous theories of different nations and individuals respecting this event. Though the origin of the world must necessarily remain for ever concealed from human eyes, there is, notwithstanding, a strong desire in the breasts of mortals to unveil it; so that we find hypotheses among all nations respecting the beginning of all things. We may divide these hypotheses into three classes:—1. The first represents the world as eternal, in form as well as substance. 2. The matter of the world is eternal, but not its form. 3. The world had a beginning, and shall have an end.

I. Ocellus Lucanus is one of the most ancient philosophers who supposed the world to have existed from eternity. Aristotle appears to have embraced the same doctrine. His theory is, that not only the heaven and earth, but also animate and inanimate beings, in general, are without beginning. His opinion rested on the belief that the universe was necessarily the eternal effect of a cause equally eternal, such as the Divine Spirit, which, being at once power and action, could not remain idle. Yet he admitted that a spiritual substance was the cause of the universe; of its motion and its form. He says positively, in his Metaphysics, that God is an intelligent Spirit (*nous*), incorporeal, eternal, immovable, indivisible, and the Mover of all things. According to this great philosopher the universe is less a creation than an emanation of the deity. Plato says the universe is

an eternal image of the immutable idea, or type, united from eternity with changeable matter. The followers of this philosopher both developed and distorted this idea. Ammonius, a disciple of Proclus, taught in the sixth century, at Alexandria, the coeternity of God and the universe. Modern philosophers, and also ancient ones (for example, Xenophanes, according to Diogenes Laertius), went further, and taught that the universe is one with the Deity. Parmenides, Melissus, Zeno of Elea, and the Megaric sect, followed this doctrine.

II. The theory which considers the *matter* of the universe eternal, but not its *form*, was the prevailing one among the ancients, who, starting from the principle that nothing could be made out of nothing, could not admit the creation of matter, yet did not believe that the world had been always in its present state. The prior state of the world, subject to a constant succession of uncertain movements which chance afterwards made regular, they called *chaos*. The Phœnicians, Babylonians, and also Egyptians, seem to have adhered to this theory. The ancient poets, who have handed down to us the old mythological traditions, represent the universe as springing from chaos, without the assistance of the Deity. Hesiod feigns that Chaos was the parent of Erebus and Night, from whose union sprang the Air (*Æther*) and the Day (*Hemera*). He further relates how the sky and the stars were separated from the earth, &c. The system of atoms is much more famous. Leucippus and Democritus of Abdera were its inventors. The atoms, or indivisible particles, say they, existed from eternity, moving at hazard, and producing, by their constant meeting, a variety of substances. After having given rise to an immense variety of combinations, they produced the present organization of bodies. This system of cosmogony was that of Epicurus, as described by Lucretius. Democritus attributed to atoms form and size, Epicurus added weight. Many other systems have existed which must be classed under this division. We only mention that of the Stoics, who admitted two principles, God and matter, in the abstract, both corporeal, for they did not admit spiritual beings. The first was active, the second passive.

III. The third theory of cosmogony makes God the Creator of the world out of nothing. This is the doctrine of the Etruscans, Druids, Magi, and Brahmans. Before idolatry was introduced into China the people worshipped a Supreme Being, *Chang-Ti*, the Mover and Regulator of the universe. Anaxagoras was the first among the Greeks who taught that God created the universe from nothing. The Romans generally adopted this theory, notwithstanding the efforts of Lucretius to establish the doctrine of Epicurus. The beginning of Ovid bears a striking resemblance to the beginning of Genesis. Clement of Alexandria therefore thinks that the Pentateuch was known in Greece and Rome before the time of Christ. It is not necessary, however, to adopt this conclusion, for the two systems of cosmogony might both have had a primitive origin. The Indian cosmogony also bears much resemblance to that of Moses. It is well known to every reader that the Mosaic cosmogony belongs to the class we are now describing. It is distinguished by its great simplicity. Rationalists regard it as an Asiatic tradition, and not as a revelation. Some of the most important sources of information respecting the different systems of cosmogony, besides the book of Genesis, are the works of Hesiod, Diogenes Laertius, Nonnus of Panopolis, Eusebius, Philo the Jew, Pliny, and Diodorus.

COSMORAMA is a species of picturesque exhibition, consisting of eight or ten coloured drawings executed in body colours laid horizontally round a semicircular table, and reflected in mirrors placed diagonally opposite to them. The spectator looks at them through convex lenses placed immediately in front of each mirror. The exhibition takes place by lamp-light only, and the lamps are so placed as not to be reflected in the fields of the mirror. There is nothing new in the invention, and the views exhibited are generally copies made from engraved views, such as those of Piranesi, De Nou, Le Bruyer, and other artists.

COSMOS. See Kosmos.

COSNE, a town, France, department Nièvre, 31 miles N.N.W. Nevers, right bank Loire, at its confluence with the Nouain. It is well built, and the streets are clean and straight. The Loire is crossed here by two suspension-bridges, and the Nouain or Nohain furnishes water-power to numerous works, amongst which are several cutleries, and an anchor manufactory. There is a considerable trade in iron, grain, wine, wood, hemp, and cattle. Under the Romans Cosne was called Condate. In 1420 it was occupied by the English, who successfully resisted all the attempts to drive them out made in the following year by the dauphin Charles. Pop. 6575.

COSSACKS (*Casacks*), the tribes who inhabit the southern and eastern parts of Russia, Poland, the Ukraine, &c., guarding the southern and eastern frontier of the Russian Empire, and paying no taxes, performing instead the duty of soldiers. Nearly all of them belong to the Græco-Russian Church, to which they are strongly attached, and to the observances of which they are particularly attentive. They must be divided into two principal classes, both on account of their descent and their present condition—the Cossacks of Little Russia (Malo-Russia), and those of the Don. Both classes, and especially those of the Don, have collateral branches. From those of the Don, who are the most civilized, are descended the Volgaic, the Terek, the Grebeskoi, the Uralian, and Siberian Cossacks. To the other race belong the Zaporogians or Haydamaks, who are the wildest and most unrestrained. Writers are not agreed as to the origin of this people and of their name. Some derive both races from the province of Casachia, so called by Constantine Porphyrogenitus. In the Turkish, *cazak* signifies a robber; but in the Tartar language it signifies a soldier lightly armed for rapid motion. Since the Cossacks came from the plains beyond the Volga, they may be the remains of the Tartar hordes who settled there at different times. Some suppose them to be of Russian origin. Their language is properly Russian, although, in consequence of their early wars with the Turks and Poles, they have adopted many words from these people. It is probable that both races of the Cossacks are descended from the United Russian Adventurers, who came from the provinces of Novogorod. Their object was to collect booty in the wars and feuds with the Tartars on the frontiers of the Russian Empire. As they were useful in protecting the frontiers, the government granted them great privileges; and their numbers rapidly increased, more especially as grants of land were made them. Thus their power was augmented, and they became, by degrees, better organized and firmly established. Their privileges, however, have been very much limited since the year 1804. In the war of 1538 3000 Cossacks of the Don made their first campaign with the Russians in Livonia. They then conquered Siberia, repulsed the Tartars from many Russian provinces, and assisted in defeating the Turks. During the frequent rebellions of the Cossacks of the Don (the last of which was conducted by the formidable Pugatscheff) quarrels arose among them, and

the great family became divided into several parts. Thus a branch of the great tribe of the Don, consisting of about 2000 men, in order to escape the punishment of their offences, retired in 1577 to the Kama and to Perm, and afterwards to the Oby. (See SIBERIA and STROGANOFF.) They drove out the Woguls, the Ostiaks, and Tartars, who were settled there. Their numbers having been much reduced by these contests with the inhabitants, and their leader being no longer able to maintain his conquest, they placed themselves under the protection of the Russian government, and obtained assistance. This branch of the Cossacks has since spread over Siberia.

In personal appearance the Cossacks bear a close resemblance to the Russians, but are of a more slender make, and have features which are decidedly more handsome and expressive. They have a quick keen eye, and an ear which is ever on the alert, and are active, spirited, and brave. Their intellect is good, and they often exhibit a remarkable degree of acuteness. In many of their domestic habits they contrast favourably with the Russians, being much more cleanly, and having a greater regard to personal appearance. Like them, they often drink to excess, but seem more alive to the degradation which results from it; and, accordingly, when they do indulge in bacchanalian orgies, have generally the sense to keep them private. The martial tendencies of the Cossacks are very decided, and have from time immemorial formed their distinguishing feature. The whole structure of society among them is military. Originally their government formed a kind of democracy, at the head of which was a chief or hetman of their own choice; while under him was a long series of officers with jurisdictions of greater or less extent, partly civil and partly military, all so arranged as to be able on any emergency to furnish the largest military array on the shortest notice. The democratical part of the constitution has gradually disappeared under Russian domination. The title of chief hetman is now vested in the heir-apparent to the throne, and all the subordinate hetmans and other officers are appointed by the crown. Care, however, has been taken not to interfere with any arrangements which fostered the military spirit of the Cossacks; and hence all the subdivisions of the population into pulks and minor sections, with military heads, and of the villages into stanitza, still remain. Throughout the empire, wherever particular alacrity, vigilance, and rapidity of movement are required, the qualities by which the Cossack is distinguished mark him out for employment. His proper sphere is to act as a light-armed trooper, protecting the rear of an army in retreat, or pushing forward in advance, so as to make it almost impossible for an enemy to escape. Each Cossack is liable to do duty from the age of eighteen to fifty, and is obliged to furnish his own horse, and to be clothed in the Polish or oriental fashion. Their principal weapons are a lance from 10 to 12 feet in length, a sabre, carabine, and pistols. The lances, in riding, are carried upright by means of a strap fastened to the foot, the arm, or the pommel of the saddle. The *kantschu*, a thick whip of twisted leather, serves them for a weapon against an unarmed enemy, as well as for the management of their horses. Though little adapted for regular movements, they are very serviceable in attacking baggage, magazines, and in the pursuit of troops scattered in flight. Their horses are mostly small and of poor appearance, but they are tough and well broken, and so swift that when they do not move in compact bodies, and carry little or no baggage, they can travel without much difficulty from 50 to 70 miles a day for several days in succession. Each pulk has two or more silken banners, usually adorned with images of the saints. The Cossacks fight principally in small bodies, attacking the enemy on all points, but principally on the flanks and in the rear, rushing upon them at full speed, with a dreadful hurrah and with levelled lances. If they succeed in breaking through the enemy they drop their lances, which are dragged along by the strap, and seizing their sabres and pistols, do great execution. If they meet with opposition, and find it impossible to penetrate, they immediately retreat, hasten to some appointed place, form anew, and repeat the attack until the enemy is put to flight, when they bring destruction on the scattered forces.

In 1570 they built their principal stanitza and rendezvous, called Tscherkask, 70 versts above Azoph, on some islands in the Don, 1283 miles from St. Petersburg, which Dr. E. D. Clarke called the *Tartar Venice*, for the houses rested on high wooden piles, and were connected with each other by small bridges. When the river was high, which is from April to June, the city appeared to be floating on the water. As it was rendered unhealthy by the overflowing of the island on which it stood, New Tscherkask was founded in 1805, on an arm of the Don, about 4 miles from the old city, to which nearly all the inhabitants removed. This forms the capital of the country of the Don Cossacks, which constitutes a government of Russia, and has an area of 59,630 square miles, and a population of 1,010,035. The town contains a handsome cathedral and a number of other richly-adorned churches, a regular theatre, a superior and other schools. The inhabitants employ themselves chiefly in fishing or in rearing cattle. They have some trade, and two annual fairs.

COSSÉ, CHARLES DE, more known by the title of *Marshal de Brissac*, was son of René Cossé, who was Lord of Brissac in Anjou, and chief falconer of France. He was born about 1505, and served with success in the Neapolitan and Piedmontese wars and distinguished himself as colonel in the battle of Perpignan in 1541. The first noblemen of France, and even the princes, received their military education in his school, while he commanded the French light cavalry. When the Emperor Charles V. attempted to besiege Landrécy, in 1543, Brissac repulsed him three times, and united himself, in spite of the superior numbers of the enemy, with Francis I., who lay with his army near Vitry. This monarch folded him in his arms, allowed him to drink out of his cup, and created him a knight of his order. After other great actions he rose to the rank of grand-master of artillery of France; and Henry II. sent him as ambassador to the emperor for the purpose of negotiating a peace. Here he proved himself a good diplomatist, and obtained for his services the office of governor of Piedmont, and the baton of marshal of France, in 1550. He afterwards returned to France as governor of Picardy, and rendered that province important services. Brissac was small, but very well made. The ladies called him the *handsome Brissac*. It is said that the Duchess of Valentinois regarded him with particular favour, and that Henry II. appointed him lieutenant-general in Italy merely from jealousy. Brissac died at Paris, Dec. 31, 1563.

COSSIMBAZAR, a town, Hindustan, province of Bengal, about a mile south of Moorshedabad. Pop. 25,000. It stands on the left bank of the Bhagirathi, the most sacred branch of the Ganges, and during the rainy season, when the river is navigable, carries on a very extensive traffic. The manufactures consist of carpets, silk goods, and wire-knitted cotton stockings, for which the place has long been famed.

COSTA, ISAAC DA, a poet and theologian, born in 1798 in Amsterdam. He studied at Leyden under Bilderdijk, who exercised considerable influence upon

the mind of the young student. In 1816 was issued his first literary venture, a translation in verse of the Persians of Æschylus, and shortly afterwards he abandoned the Jewish religion, in which he had been brought up, for that of Protestantism. He was called to the Institute of Amsterdam in 1840, and soon acquired a high reputation both for his poetic and theological works. Poetry he continued to write up till 1857, when his last poem, the Battle of Nieuport, was published. Among his theological works we may mention a Refutation of Strauss' Life of Jesus, a History of the Destinies of the People of Israel (translated into English and German), Considerations on the Spirit of the Age, &c. He died in 1860.

COSTA, Lorenzo, an Italian painter, founder of the Ferrarese school, was born in Ferrara about 1430. While yet young he set out on his art travels, visiting Florence, where he copied several of the works of Fra Filippo and Benozzo. On his return to Ferrara he was employed to decorate the choir of the Church of San Domenico, and was invited to the ducal court, where he painted a number of the portraits of the princes and nobles. Shortly afterwards we find him at Ravenna, at Bologna, where he executed a St. Sebastian Pierced by Arrows, a Virgin, a St. James, a St. Jerome, &c. At Mantua, whither he was invited by Francesco Gonzaga, he painted the greater number of the pictures in the palace, then being restored by that prince. Costa died in 1499 at Florence, leaving behind him a reputation for keenness of observation, correctness in design, and great simplicity and grandeur in form, together with harmonious grouping.

COSTA RICA, the most southern state of the Republics of Central America; bounded N. by Nicaragua, from which it is separated N.E. by the river San Juan; E. and N. by the Caribbean Sea; E. and S. by Colombia; and S. and W. by the Pacific; between lat. 8° and 11° 30′ N.; lon. 83° and 85° W. Area about 21,500 square miles. The state claims, however, the territory bounded on the south by an imaginary line from Burica Point to Escudo de Veragua, a small island on the Atlantic coast; but this claim is disputed by the government of New Granada. The country is intersected diagonally by the primary range of the isthmus, which throws off numerous spurs on either side, giving to the surface a continued alternation of abrupt heights and sudden depressions. The principal range contains several lofty eminences and volcanoes, both active and extinct or dormant, including those of Orosi, Votos, and Cartago; from the summit of the last of which both the Pacific and the Atlantic can be distinctly seen. The north-west districts are more rugged and mountainous than the south-west, but along the coast of the Pacific, especially around the Bay of Nicoya, the country has a most beautiful and picturesque appearance, being diversified by valleys and intersected by numerous streams. Costa Rica is said to contain some rich gold mines; they are, however, now not at all, or very little wrought. Silver and copper are also found, but they in like manner receive little notice. In all parts of the state, with exception of the sea coasts, the climate is mild and temperate, never subject to excessive heats or colds, and rarely experiencing any other vicissitudes than those from the dry to the rainy season. It is therefore extremely well adapted to agricultural purposes, and capable of bringing to maturity many European plants, as well as most of those peculiar to the tropics. The soil is remarkably fertile, especially on the table-lands, and in the valleys between the mountains. Among its agricultural productions are coffee, cacao, Indian-corn, tobacco, sugar, and a little wheat, which last not being an article of general consumption, is not much attended to. The horses of Costa Rica are of an inferior description, but the mules are greatly esteemed; and cattle, sheep, goats, and hogs are reared in great numbers, and of excellent quality. The wild animals include the cougar, wolf, tapir, wild boar, fallow-deer, hares, sloths, and squirrels. The wooded coasts of the Pacific are much infested by dangerous reptiles, and great devastation is frequently caused by locusts. The birds, which include vultures, pelicans, parrots, pigeons, ducks, quails, teal, exhibit the gayest and most beautiful plumage.

The woods of Costa Rica are valuable, comprising mahogany, cedar, Brazil, and various other kinds of timber; and on the sea coast of Nicoya, some pearls, and large quantities of mother-of-pearl shells are found. Coffee, however, forms the most important product of the state. Its cultivation, though only introduced about the year 1830, has increased so rapidly that about 5000 tons of the seeds are now exported annually. Tobacco, which is of excellent quality, is a government monopoly, and is sent chiefly to Nicaragua, though some of it finds its way to the British market. The other exports are gold, sugar, Brazil-wood, and mother-of-pearl. The imports consist chiefly of manufactured goods. Of late years the trade has considerably increased, the imports averaging rather less than £300,000, and the exports £460,000.

Costa Rica is divided into six provinces, the names of which are San José, Cartago, Alajuelo, Heredia, Guanacaste (now called Monrovia), and Punta Arenas. The principal cities are San José, the capital; Cartago, Heredia, Estralla, Esparza, and Ujarras. The two established ports of entry are Punta Arenas, where the foreign trade is principally conducted, in the Gulf of Nicoya, and Matina, on the Caribbean Sea. The government of Costa Rica was established in 1823, and is accounted the best and most liberal in Central America. It has a representative Legislature, and the executive is intrusted to a president and vice-president, elected for four years, assisted by two ministers nominated by the president. The religion is Roman Catholic. The annual net revenue of the state averages over £300,000. The inhabitants are extremely industrious and orderly, and are making rapid strides in wealth and improvement. The population is variously stated, some authorities quoting as low as 120,000, others reaching to 165,000; the independent Indians, estimated at 12,000, are included in both calculations.

In 1849–50 the government granted to Mr. G. Lafond, the French consul-general, a tract of land from the Gulf of Dulce on the Pacific, to the Boca del Toro, on the Caribbean Sea, for the purpose of opening a route between the two oceans. The route across the isthmus by the San Juan River, along part of the frontier of Costa Rica, is so far opened that steamers now ply on the river in connection with others on the Lake of Nicaragua.

Costa Rica was discovered by Columbus in 1502, and received its name from him owing to the specimens of gold he received at the various points he landed at on his eastward voyage along the coast. In 1514 Hernan Ponce and Bartolome de Hurtado were sent from Panama to explore the Pacific coast. They founded two small colonies at Fonseca and Bruselas, which were, however, broken up in a few years. The settlers under Solano and Acuña are presumed to have been the founders of Cartago, which held its rank as capital until 1823. In 1530 Alvarado subjected the Indian tribes of Turialva. The colony gradually extended; in 1540 the province was recognized under the name of New Carthage,

and its organization appears to have been complete about 1574, when its third governor was appointed by the court of Madrid. The first check to the prosperity of the province was a massacre of the male colonists by the Talamanca Indians, in whose territory and by whose labour the gold mines of Tisingal were worked. In 1660 the Spaniards re-entered the colony, and again subjected the Indians, who again massacred their masters in 1709. Another serious check was the depredations of the buccaneers along the coasts, which destroyed all trade, and kept the inhabitants prisoners in their mountains for three-quarters of a century. The province began to revive about the middle of the eighteenth century, when the port of Caldera was opened, but with the mines of Tisingal the country had lost its importance until about 1830, when it found a more secure and increased source of wealth in the coffee plantations. During the period which followed the declaration of independence (1821) Costa Rica joined neither of the two parties (the imperialist and the federalist), which divided the Central Americans, but organized a provisional government, which, after repressing a revolt of the imperialists (April, 1823) transferred the seat of government from Cartago to San José. Costa Rica formed one of the five states of the confederation of Central Africa until the year 1840, when she peaceably withdrew from the expiring contract. In April, 1842, General Morazan landed in the state with an armed force, with a view to re-establish the confederation, and was received with open arms, the people and soldiers deserting their president at the first opportunity. Morazan, by some extreme measures for recruiting his army and treasury, soon exhausted the patience of the Costa Ricans, who rose in fierce rebellion, and after a short struggle took their late idol prisoner and put him to death. In 1856 the state, alarmed at the predatory movements of the notorious filibuster Walker, declared war against him, defeated him, driving him back into Nicaragua, and joining the troops of the other states succeeded in hemming him in in the city of Rivas, where he capitulated to the commander of a United States war ship, under whose safeguard he left the country. Several revolutions and constitutional changes have taken place in recent years, but they have not been of an important nature.

COSTER, Laurens (called *Janszoon*, that is, *son of John*), a wealthy citizen of Haarlem, was born in that city in 1370 or 1371. He was a member of the chief council in 1418, and by turns performed the duties of a judge and a treasurer. In 1421, or according to some 1399, he was appointed to the office of sacristan (*Koster*) of the parochial church at Haarlem, and continued in this station; and from this office, which at that time was very honourable, he derived his surname. He died, probably of the contagious disease which raged in the latter part of 1439, in Haarlem. This is all that the contemporary city records have preserved of his history. More than a hundred years after his death, in the middle of the sixteenth century, traces of a tradition appeared, which assigned to the city of Haarlem the invention of the art of printing. At this time Hadrian Junius produced (in a work entitled Batavia, written between 1562 and 1571, but not published till 1588, after his death), from the verbal information of some aged people, who again derived their knowledge from others, a complete history of the invention of the art of printing, in which Coster acted the chief part. During his walks in a wood near Haarlem (as Junius relates) he carved letters, at first for his amusement, out of the bark of beech-trees. He persevered in these experiments till he had finished entire lines, and finally proceeded so far as to cut out whole pages on the sides of boards. With blocks of this sort he effected the impression of the *Spegel onzer Behoudenisse*. After this he improved his mode of printing by casting lead or pewter types. But a person of the name of John, or Johann Fust, or again Gens Fleich, whom he had employed as an assistant, stole his printing apparatus one Christmas night, and fled with it first to Amsterdam, and then to Cologne and Mentz, at which last place this theft occasioned the general diffusion of the art invented by Coster. In Holland the people were so firmly convinced of the truth of this story that a statue in honour of Coster was erected in 1622, and another in 1856. His house, which fell down in 1818 through age, was shown with the greatest pride; and in 1740 the jubilee of his invention of the art of printing was celebrated. This celebration was repeated in 1823, the justice of the claim of the Dutch being considered to be established by Meerman's Origines Typographicæ (1765), and Koning's Verhandeling over het Oorsprong der Boekdrukkunst (1816). The examination of the subject by Dr. Van Linde (The Haarlem Coster-legend, 1870), himself a native of Holland, scatters to the winds the claims of Haarlem to the invention of printing, and shows that Holland, like other countries, was indebted for it to the Mayence school, and that Haarlem was preceded by several other Dutch towns in the adoption of the invention.

COSTMARY, or Alecost (*Balsamita vulgaris*), a herbaceous plant of the *Compositæ* family. The plant is a hardy perennial, a native of Italy, introduced into this country in 1568, and common in almost every rural garden. The name implies that it is the *costos* or aromatic plant of the Virgin Mary. In France it is used in salads, and was formerly put into ale and negus, hence the name of alecost. In this country it is now little used, except for the pleasant fragrance of its leaves in a nosegay.

COSTS, in law, are the expenses incurred by the plaintiff and defendant, consisting of money paid for stamps, &c., to the officers, the court, or to counsel, attorneys, and solicitors for their expenses and fees. Costs are to be considered as being between attorney and client; that is, the expenses and fees the former is to recover from the latter: or as between party and party; that is, being those to which the successful party is, in some cases, entitled to recover from the unsuccessful one. Neither party was entitled to costs at common law, but the statute of Gloucester, 6 Edward I. cap. iv., gives costs to a successful plaintiff, and 2 and 3 Henry VIII. cap. vi., and 4 Jac. I. cap. iii., give costs to a victorious defendant. Pauper suitors (such as will swear themselves worth no more than £5, except their wearing apparel and the matter in question in the cause) are exempted from paying costs, although they are entitled to receive them if successful. In proceedings between the crown and a subject no party was entitled to costs, but by 18 and 19 Vict. cap. xc. costs are paid by either party in suits by the crown. In order to discourage petty litigation, the legislature formerly provided that the party at fault should pay double or treble costs; but such provisions are now repealed, and the party is only liable to pay a reasonable indemnity, to be taxed (that is, all the items examined and allowed) by the officer of the court appointed for that purpose (the taxing-master). In actions in which the plaintiff recovers damages under 40*s.*, he is in certain cases not entitled to costs unless the presiding judge certifies he ought to have them; and in all other cases he is not entitled to them if the judge certifies he ought not to have them. Any plaintiff who carries a case to a superior court which would have been cognizable

in a county court, and who recovers no more than £20 in an action arising out of a contract, or £5 for a wrong independent of contract, will have no costs unless he satisfies the court he had sufficient reason for taking that course. Where, out of several issues, some are found for the plaintiff and some for the defendant, the plaintiff is entitled to costs only on these issues on which he may succeed, and the costs of the defendant's issues will be deducted from his. In equity the person who fails must be deemed liable to costs, which, however, do not rest entirely in the discretion of the court, for the *primâ facie* claims to costs may be rebutted by the circumstances of the case, and it is for the court to decide whether those circumstances are or are not sufficient to rebut the claim. In criminal cases, where the party accused had not been committed or held to bail, he may have his expenses if the court thinks the accusation unreasonable, and the court has power to allow the expenses of witness for accused persons where they have been bound by recognizance. In matrimonial suits, the wife, whether petitioner or respondent, is generally entitled to her costs from the husband, and she can compel him to deposit or give security for a sufficient sum to meet the costs of the hearing, and her attorney is entitled to her taxed costs to the amount of the sum so deposited, although she fails in the suit; if she is successful she is entitled to all her costs, although the amount exceeds the sum deposited or secured. If she does not get a sum deposited or secured, and fails, the court will not compel the husband to pay the costs after the hearing has taken place.

COSTUME, in the fine arts, the observance of propriety in regard to the person or thing represented, so that the scene of action, the habits, arms, proportions, &c., are properly imitated. The peculiarities of form, physiognomy, complexion; the dress, ornaments, habitations, furniture, arms, &c., should all be conformable to the period and country in which the scene is laid. The rules of costume would be violated by the introduction of a palm-grove and a tiger in a scene in Russia, by the representation of American Indians in turbans, or of Romans with cannons at the siege of Carthage, or an inhabitant of the East seated at table with a knife and fork. That the ancient painters, and even celebrated masters of the modern European schools, are often chargeable with deviations from propriety in regard to costume, is not to be denied; but nowhere have they been so glaring as on the modern stage, where Greek, Turkish, and Peruvian princes used to make their appearance in long velvet mantles, embroidered with gold; Merope and Cleopatra were equipped in hoop-petticoats, Medea and Phædra in French head-dresses; peasant girls were dressed out in whalebone, and heroes emerged from the battle in stiff coats, not a fold of which was disordered. Le Kain and Mademoiselle Clairon, it is said, were the first who introduced propriety of costume on the stage under the patronage of the Count de Lauraguais; but they excluded only the grosser absurdities: Scythians and Sarmatians were clothed in tiger skins, Asiatics in the Turkish dress; but the old costume was retained in other respects. The scenery of the stage was as incongruous as the dresses. It is not long since Semiramis issued from a palace adorned with Corinthian columns and entered a garden in which a whole American flora was blooming; or perhaps she was seated on a throne overshadowed with a canopy *à la Polonaise*. Those by whom she was surrounded were dressed in the Turkish style; while a master of horse, in the costume of the age of chivalry, offered her his hand. In Germany the stage at that time was no better in this respect. It is not very long since the companions of Theseus made their appearance there with large perukes; and in the Clemenza di Tito, Roman soldiers marched on the stage with stiff boots and stiffer queues. The Germans, however, first made a thorough reform of these absurdities, and the National, now Royal, Theatre, in Berlin, in point of scenery and costume, is at present the most correct in the world. In France, Talma reformed the Parisian stage. What he did in this respect for the drama, David (who had, however, a predecessor in Vien) effected for painting, and his school is entitled to the honour of having strictly observed propriety of costume. Some of our more recent authors and artists sin on the opposite side by a pedantic heaping up of minute details, which may certainly please the eye of an antiquary, but inevitably results in reducing in a more or less degree the intimate sympathy between the writer and painter on the one hand, and the reader and spectator on the other. Sir Walter Scott in literature, and Alma Tadema in art, may be mentioned as examples of the school which has erred in this respect. It must be admitted that there is great difficulty in keeping the middle course, the natural bias of the poet or painter, the appreciation of the learned, or the applause of the ignorant having all an influence on the creative imagination; yet there is good reason to hope that the time is not very far distant when the possession of antiquarian learning need not make the artist vain of it, the connoisseur tickled with it, or the general public bewildered at it.

CÔTE-D'OR, a chain of mountains in Burgundy, so called from the abundance of excellent wine which they yield. Their height varies from 1400 to 1800 feet. The chain runs from N.N.E. to S.S.W., and is about 36 leagues long, beginning at the plateau of Langres, and extending to the sources of the Bourbince and the Dheune.

CÔTE-D'OR, an inland and eastern department of France, having Dijon as its capital, formerly part of province Burgundy; with the departments Aube and Haute-Marne on the N.; E. Haute-Saône and Jura; S. Saône-et-Loire; W. Nièvre and Yonne, between lat. 46° 55′ and 48° N.; lon. 4° 5′ and 5° 35′ E. It derives its name from a chain of hills extending south-west from Dijon, called Côte-d'Or, or hill of gold, on account of the excellence of its wine. Area, 8354 square miles. The department belongs to the basins of the Seine, the Loire, and the Rhone; but chiefly to those of the first and last. It is watered N.W. by the Seine, which has here its source, and its affluents the Aube, Ource, Armançon, and Serain; E. by the Saône, and its affluents the Vingeane, Tille, Ouche, and Dheune; and S.E. by the Arroux, an affluent of the Loire. It is also intersected S.E. to N.W. by the Burgundy Canal. The surface is rather elevated, presenting some plains to the east and north-west, but generally covered by offsets of the little mountain range of the Côte-d'Or, which traverses the department south to north; height, 1400 to 1800 feet; uniting the Cevennes Mountains to the plateau of Langres, and forming part of the watershed between the basin of the Mediterranean and that of the ocean. In the south the soil is rich and fertile, elsewhere it is generally stony. The climate is very variable. The crops are liable to suffer considerable damage from the intense frost of spring and the heavy hail showers of summer. Grain of various kinds is generally and successfully cultivated, the produce exceeding the consumption. French beans (haricots), prunes, hemp, rape, and beet-root are raised in considerable quantities. There are extensive forests, chiefly of coppice-wood. The vineyards of the eastern slopes of the Côte-d'Or, called the Côte-de-Nuits and the Côte-de-Beaune, produce in abundance the celebrated wines of Upper

Burgundy, both red and white; among the former may be named Romanée-Conti, Chambertin, Vosne, and Nuits; and among the latter Puligny. Red and white sparkling wines are also made. Excellent horses, good sheep and cattle, and bees in large numbers, are extensively reared. The iron ore extracted supplies about fifty iron-works. There are two mines of anthracite, and quarries of lime, gypsum, marble, lithographic stones, millstones, &c. Large quantities of tiles are made, and earthenware of good quality, paper, cloth, leather, beet sugar, beer, spirits, &c. The trade of the department is much facilitated by the Saône and Burgundy Canal. The department is divided into four arrondissements, subdivided into thirty-six cantons and 717 communes. Although wages (particularly those of agricultural labourers) are exceptionally high, and the inhabitants generally seem in a fairly prosperous condition, the population has been steadily decreasing, as shown by the following figures: pop. in 1846, 396,524; in 1866, 382,762; in 1872, 374,510.

COTERIE, a French word now much used in English society. Originally *coterie* was a commercial term, signifying an association in which each member furnished his part (*quota*), and received his proportion of the profits, or bore his proportion of the loss. Thence it was used for small societies, in which certain individuals are in the habit of meeting, and each contributes his share of conversation and entertainment. A *coterie* consisting of ladies and gentlemen of talent, vivacity, and agreeable manners, is one of the finest productions of modern society. It is from *coteries* that we derive a large stock of the most entertaining and instructive matters in the numberless French memoirs.

COTES-DU-NORD, a maritime department, in the N. of France, forming part of ancient Brittany; capital Brieuc; having N. the English Channel, E. department Ille-et-Vilaine, S. Morbihan, W. Finistère. It comprehends several small islands in the Channel, the principal of which are Brehat and the Seven Islands. Area, 472,198 acres; 1967 square miles. To the north it is watered by a number of small streams, which fall into the English Channel; and to the south by several which fall into the Vilaine and Aulne. From east to west it is traversed by a chain of hills called the Montagnes Noires, the culminating point of which is Mont Menez, 1112 feet above sea-level. The coast extends about 150 miles, and is much indented. It presents a series of granite cliffs, at the foot of which is a strand of considerable breadth in some localities. There are several tolerable ports at the mouths of the small rivers. The only good land is found in the vicinity of the coast. The rest is inferior, a large portion being sand and stones, and a considerable breadth covered with heath. Agriculture is in a very backward state, but the produce of grain is sufficient for the consumption. Cider is produced in large quantities. Hemp, flax, hay, pease, beet-root, &c., are extensively grown. One of the main branches of industry is the rearing of cattle and horses; the latter held in high estimation. Sheep are comparatively scarce, and of inferior quality. Bees are very numerous. Excepting iron, which is wrought to a small extent, the minerals of the department are unimportant. Granite of very fine quality is abundant, but not much used. On the coast the herring, pilchard, and mackerel fishery is pursued with activity. The principal branch of manufacturing industry, and that for which the department is celebrated, is the spinning of flax and hemp, and the weaving of linen and sail-cloth, sent principally to the South American market. The department contains numerous tanneries, paper-works, manufactures of woollen yarn, common woollen goods, shoes for the troops, beet sugar, earthenware, &c. The only navigable rivers are the Rance and Blavet; a few of the others, however, are accessible at high water. Two canals, that between Nantes and Brest, which traverses the department for a distance of 40 miles, and that of the Ille and Rance (53 miles long), traverse the department. The language commonly spoken is the Bas-Breton. The people are rough, rude, passionate, and indolent, but very hospitable, and make excellent soldiers and seamen. In the interior the utmost wretchedness seems to prevail; the cottars' houses generally have but one apartment, the beds are ranged along the walls, and frequently one placed over the other; often, too, the cow or the horse shares part of the humble dwelling. Along the coast the state of matters is much better. Although the farms are not larger than the inland ones, they are much better cultivated; vegetables of superior quality are reared and sent into the larger towns, and a considerable trade is done in cattle and horses, butter, honey, wax, &c. Of recent years the average number of vessels entered and cleared is over 500, having a tonnage of nearly 60,000. The department is divided into five arrondissements, subdivided into forty-eight cantons and 384 communes. Pop. 622,295.

COTESWOLD (or COTTESWOLD) HILLS, a range of hills, England, county Gloucester, which they traverse north to south for upwards of 50 miles; extreme elevation, near Cheltenham, 1134 feet. They are divided into the Upper and Lower Coteswolds; the waters which descend from the west declivity, after a short course, fall into the Severn.

COTHURNUS, with the ancients, a kind of shoes laced high, such as Diana and her nymphs are represented as wearing. They are still worn by the hunters in Italy. They were particularly in use among the Cretans. Galen and Pollux describe them as reaching up to the middle of the calf, and laced tight by means of thongs, to protect the foot and ankle, without obstructing freedom of motion. The tragic actors also wore them, perhaps at first as commemorative of the expeditions of Bacchus; and at a later period, in order to give additional height to the actors who played the part of heroes. Hence cothurnus is sometimes used figuratively for *tragedy*. The cothurnus used for this purpose differed from the hunting cothurnus in this respect, that it had a sole of cork at least four fingers thick.

COTIN, CHARLES, counsellor and almoner of Louis XIV. and member of the French Academy, was born at Paris in 1604. He is indebted for his notoriety, in a great measure, to the satires of Boileau. He possessed a knowledge of theology and philosophy, understood the Hebrew and Syriac languages, and studied the Greek authors so diligently, that he could repeat large portions of Homer and Plato by heart. Among his poems are some which rise above mediocrity. It has often been supposed that Boileau introduced the name of Cotin into his satires because it furnished a convenient rhyme, and Moore refers to this in his Life of Byron. But Boileau had good reasons for complaining of Cotin, who had represented him at the Hôtel Rambouillet as a dangerous man. The ridicule of Boileau exasperated Cotin still more, and he attempted every means of silencing him. His influence at court, his title and wealth, appeared to give him the means of effecting this object; but unluckily his follies drew upon him a new enemy in Molière, who, in his Femmes Savantes, introduced him on the stage, and exposed him to ridicule under the name Trissotin, which Molière at first wrote Tricotin. The sonnet to the Princess Urania was composed by Cotin; and he engaged in a dispute respecting this poem with Ménage, in the presence of a select society, collected by Mademoiselle at the Lux-

embourg, in which the disputants used the same kind of language which Molière places in the mouths of Trissotin and Vadius. Cotin died in 1682. His Œuvres Mêlées appeared in 1659, at Paris, and his Œuvres Galantes, in two volumes, in 1663.

COTOPAXI, the most remarkable volcanic mountain of the Andes, in Quito, about 60 miles N.E. of Chimborazo; lat. 0° 43′ S.; lon. 78° 40′ W. It is the most beautiful of the colossal summits of the Andes. It is a perfect cone, which, being covered with an enormous layer of snow, shines with dazzling splendour at the setting of the sun, and stands forth in bold relief from the azure heavens. This covering of snow conceals from the eye of the observer the inequalities of the ground. No point or mass of rock penetrates the coating of snow and ice, or breaks the exact regularity of the conical figure. The crater is surrounded by a small circular wall, which, when viewed through a telescope, appears like a parapet. Its height above the sea is 18,875 feet. It is the most tremendous volcano in Quito, and its explosions have been most disastrous, spreading destruction over the surrounding plains. Remarkable eruptions took place in 1698, 1738, 1742, 1744, 1766, and 1768; and one in 1803. In 1698 the eruption destroyed the city of Tacunga, with three-fourths of its inhabitants, and other settlements. In 1738 the flames rose nearly 3000 feet above the brink of the crater; and in 1744 its roarings were heard as far as Honda, on the Magdalena, 600 miles distant. With respect to the explosion of 1803, Humboldt observes, 'At the port of Guayaquil, 52 leagues distant in a straight line from the crater, we heard day and night the noise of this volcano, like continued discharges of a battery; and we distinguished these tremendous sounds even on the Pacific Ocean.' Eruptions on a somewhat less magnificent scale took place in 1851 and 1856. In viewing this volcano everything contributes to give it a most majestic and awful character. The pyramidal summits of Ilinissa, the snowy ridges of the other mountains, the singular regularity of the inferior line of snow, and the luxuriance of the great plains, offer an unparalleled assemblage of the grand and picturesque features of nature. Humboldt found it difficult to ascend the mountain, in 1802, as far as the limit of perpetual snow, and he pronounces it impossible by any human art to reach the summit.

COTRONE, a seaport, Naples, province Catanzaro, at the mouth of the Esaro, in the Ionian Sea, 36 miles E.N.E. of Catanzaro; pop. 5807. It occupies the site of the ancient Crotona, which is said to have been founded seven centuries before the Christian era, and was long one of the richest and most populous cities of Magna Græcia. It is defended by a strong citadel, and otherwise fortified, but is very wretchedly built, consisting of narrow dismal streets and houses of the poorest description. Its harbour, protected by a mole and by the tongue of land on which the town is built, is too shallow to admit large vessels, and the trade is insignificant.

COTTA, Johann Friedrich, Baron von, an eminent bookseller of Germany, was born at Stuttgart, April 27, 1764. He was the son of a cavalry officer, and thought of following the profession of arms, but soon afterwards devoted himself to the study of mathematics and jurisprudence at Tübingen. After he had finished his studies he made a journey to Paris, where he was introduced to some of the most celebrated literati of that gay capital. On his return he undertook the management of the publishing firm founded in 1642 by an ancestor and enjoying a world-wide reputation under the title of the J. G. Cotta'sche Buchhandlung. In 1794 he became the publisher of the Horen, which brought him into close connection with Goethe, Schiller, Herder, and the other great minds of the time. Soon after was founded the Allgemeine Zeitung, a journal which has had considerable influence on the political and literary thought of Germany up till the present day. Among the more successful of the periodicals and journals published by this house may be mentioned the Ausland, the Morgenblatt, Dingler's Polytechnisches Journal, and the Politische Annalen. All these different publications are still carried on in Stuttgart, Tübingen, Augsburg, Leipzig, and Munich. Baron Cotta held many public offices of responsibility during his life. His wealth was great, and he applied it liberally in procuring valuable contributions to the various journals published by him. He died on the 29th December, 1832.

COTTBUS. See Kottbus.

COTTIN, Sophie Ristaud, better known by the name of *Madame Cottin*, the author of several novels and works of entertainment, was born in 1773 at Tonneins, in the French department of Lot et Garonne, married, at the age of seventeen, a banker at Bordeaux, and went soon after to Paris, where in a few years she lost her husband, whose affairs had been thrown into serious disorder by the revolution. To divert her thoughts she wrote down the fancies and reflections that strongly occupied her active mind, without supposing that they would be of interest or value beyond the circle of her immediate friends. In the ease with which she expressed her thoughts she displayed a talent which even those most intimate with her had not hitherto appreciated. Her first attempts were small poems, and a history of 200 pages. One of her friends having occasion for fifty louis-d'or, in order to leave France, from which he was compelled to flee for having expressed unpopular sentiments, Madame Cottin, to assist the unfortunate man, published her Claire d'Albe, but kept her name a secret. The necessity which she felt of pouring out her feelings determined her to appear again as an authoress, and she produced Malvina, Amélie de Mansfield, and Elizabeth, or the Exiles of Siberia. The eloquence and fervour with which she expresses the most secret feelings of the heart have been much admired, especially by her own sex. Her circumstances enabled her to devote the profits of her works to benevolent objects. A painful disorder prevented her from finishing a religious work which she had begun, and another on education. The latter was the only one of her works for which she was anxious to gain a favourable reception with the public; for, singular as it may seem, she disapproved, in general, of women's appearing as authors. She died, after three months' suffering, August 25, 1807. Her works are contained in the collection Œuvres complètes de Madame Cottin (Paris, 1806).

COTTLE, Joseph, a bookseller and publisher of Bristol, and the author of some now almost completely forgotten poems, was born in 1774. The earliest poems of Southey and Coleridge were published by him, and these two poets in later life repeatedly expressed their appreciation of his assistance and kindness to them, and of his general generosity of character. Cottle's own poems, and those by his brother Amos, are satirized in Byron's English Bards and Scotch Reviewers. A prose work of this honest follower of literature, Recollections of Coleridge, has some value as containing many details of the early life of the poet. Cottle died in 1853.

COTTON, the name given to the soft cellular hairs which encircle the seeds of the *Gossypium*, a genus of plants found wild in intertropical regions both of the Old and New World, and whose original habitat does not appear to be distinctly ascertained. The genus *Gossypium* belongs to the natural order Malvaceæ, so that cotton is allied to the mallow and

hollyhock. Botanists have subdivided the cotton plant into numerous species, which, however, may be generally classed under two principal heads—the *Gossypium herbaceum*, or *herbaceous cotton;* and the *Gossypium arborescens*, or *tree cotton*. Of these, the first is an annual, attaining a height of from 18 to 24 inches; but in certain localities developing itself into a shrub of the size of a currant bush. It is characterized by the shortness and roundness of the lobes of its leaves, its pale yellow flowers, and the purple spot at the base of each petal. The seed-vessel is a three-celled pod, which bursts in the process of ripening. The arborescent, or tree cotton, varies from 15 to 20 feet in height, and has a woody stem; branches smooth at their lower, but covered with down at their upper extremity; leaves five-lobed, borne upon an elongated petiole; flowers axillary, solitary, and of a purple colour. Among cotton-planters three descriptions of the plant are recognized, according to the form which each respectively presents to the eye, viz.:—*herbaceous cotton*, *shrub cotton*, and *tree cotton*. Of these the first two comprehend the green-seeded, or *short-staple* cotton, and the last the black-seeded, or *long-staple* cotton, designations by which the two principal divisions of cotton wool are known in mercantile language.

The principal places in which cotton is cultivated at the present day are the southern states of the American Union, the West Indies, Brazil, Guiana, and other countries in South America, Egypt, India, China, and the island of Bourbon. The most celebrated growth is the so-called *Sea-island cotton*, cultivated on the low sandy islands lying along the coast of South Carolina and Georgia from Charleston to Savannah. It produces the black-seeded, or long-staple cotton, and is said to be indebted for its excellence to the action of the sea-spray, the plant gradually deteriorating in quality as it is removed farther inland. The most generally cultivated species is the herbaceous cotton, which forms the staple of the produce of the United States, and is also extensively grown in the East Indies and other places. The seeds are sown in the spring in drills of about a yard in width, the plant appearing above ground in about eight days afterwards. The rows of young plants are then carefully weeded and hoed, a process which requires to be repeated at two or three subsequent periods. A light soil which permits the roots to extend is the best for the cotton plant. No hoeing takes place after the flowering has commenced, from which a period of seventy days generally elapses till the ripening of the seed. To prevent the lustre of the cotton wool from being tarnished, the pods must not remain ungathered longer than eight days after coming to maturity. The cotton wool is collected by picking with the fingers the flakes from the pods, and then spread out to dry, an operation which requires to be thoroughly performed. The cotton now comes to be separated from the seeds, a process formerly effected by manual labour, but which is now generally accomplished by the *cotton-gin*, a machine consisting of two rollers turning in opposite directions, and moved in some cases by treadles, in others by steam or horse power. A board, on which the cotton is spread, is placed between the rollers, which, from their close juxtaposition, allow the wool to pass between them, but leave the seeds behind. In the case of the Georgian short-staple cotton, the seeds of which adhere too strongly to be separated by the above method, the *saw-gin*, the invention of Mr. Whitney, an American, is used. After being thus cleansed from the seeds, the cotton wool is formed into bales and compressed by treading or the hydraulic press. It is now ready for delivery to the manufacturer or for exportation.

The following is a description of the various qualities of cotton as recognized in the commercial world:—

Long-staple Cottons.

Georgian.—Also known as Sea-island cotton, fibre long, strong and silky, and of a silvery whiteness; the finest quality of cotton known.

Bourbon.—Very fine, clean, shining, and of a yellowish white. The term *Bourbon cotton* is frequently applied to a species extensively grown in India, and originally introduced from the island of Bourbon. It is a variety of the *Gossypium barbadense*, a species to which the Sea-island, the New Orleans, and other American cottons, likewise belong.

Egyptian.—Strong and fine, of a dull yellow colour. The culture of cotton, after having completely declined in Egypt, was revived by Mehemet Ali, and is now an important branch of national industry.

Porto-Rico.—Fibre soft and strong, fine, and of a silvery whiteness.

Long-staple Cayenne.—Fibre fine, straight, and wiry; of a shining yellowish white.

Pernambuco.—Strong and regular; of a yellowish white.

Motril or Granada.—Fibre very fine; used for making caps, but that of Pernambuco is preferred for this purpose.

Bahia.—Fibre tolerably fine, but not so straight as the preceding.

Camouchi.—A Brazilian cotton, coarser than that of Pernambuco, which it resembles.

Para.—Fibre strong, and rather fine; of a yellowish white.

Maranham.—Fibre coarse, hard, and strong; of a dull yellowish white.

Hayti.—Fibre fine and long; yellow, and unequal in quality.

Minas.—Of a dirty yellow colour; fibre fine and long.

Guadaloupe.—Fibre strong; yellowish white, sometimes yellow.

Cuba.—Fibre strong and wiry, rather rough, and of a dirty white colour.

Martinique.—Fibre coarse, and of a yellow colour.

Cumana.—Fibre white and very uneven.

Caracas.—Of a dull yellow colour, and an uneven brittle fibre.

Carthagena.—Of a dull white colour, and coarse fibre; often mixed with a cotton which resembles that of Pernambuco.

Short-staple Cottons.

Louisiana.—Fibre fine, smooth, not too short, and of a slightly yellowish white; troublesome to spin.

Short-staple Cayenne.—A rougher and more uneven description of cotton than the long-stapled Cayenne.

Alabama.—Of an equal length of fibre with either of the preceding, but less fine and compact; of a beautiful white colour.

Mobile.—Of an even fibre, and slightly yellowish white colour; rather long and coarse.

Tennessee.—Nearly resembling that of Mobile.

Carolina.—Fibre fine, white, and even.

Georgia Short-staple Cotton.—Fibre wiry, fine, and even. It is so difficult to separate from the seed that, previous to Whitney's invention of the saw-gin, it was not thought worth the trouble of cultivating.

Senegal.—White, and apparently of a good quality, but so ill prepared as to be brittle and almost impossible to spin.

Virginia.—White; of rather a fine and wiry fibre.

Smyrna.—This term is generally applied to the cotton from the Levant, which once supplied almost the whole demand of Europe. It is of inferior quality for manufacturing purposes, but from the circumstance of its inflammable nature is said to be well adapted for candle-wicks.

Surat.—Under this name are included various qualities of cotton, white or slightly yellowish, and of a strong fibre.

Madras.—Of a short fibre, and fine yellow colour.

Bengal.—Fibre very short, fine, and even.

Cotton has been cultivated in India and the adjacent islands from time immemorial. It was known in Egypt in the sixth century before the Christian era, but was then probably imported from India. Herodotus is the first Greek author who mentions it, and calls it by the name of *tree wool*. In the narrative of the expedition of Alexander the Great to India we find cotton mentioned as composing the

substance of the dress which was then universally worn by the natives of that country. Cotton cloths are stated as one of the articles of merchandise imported by the Romans from India. It was not, however, till a comparatively late period that the nations of the West became acquainted with this useful commodity, and even then it appears only to have been used as an article of the greatest luxury. The introduction of the cotton-shrub into Europe dates from the ninth century, and was first effected by the Spanish Moors, who planted it in the plains of Valencia. Cotton manufactories were shortly afterwards established at Cordova, Granada, and Seville; and by the fourteenth century the cotton stuffs manufactured in the Kingdom of Granada had come to be regarded as superior in quality to those of Syria. About the latter period, also, cotton thread began to be imported into England by the Venetians and Genoese.

In China the cotton-shrub was known at a very early period, and cultivated as an ornamental plant in gardens; but it does not appear to have been turned to any account as an article of manufacture till the sixth century of the Christian era, nor was it extensively used for that purpose till nearly the middle of the fourteenth century. The attachment to old usages and the hatred of innovation, so characteristic of the Chinese, seem to have long retarded the adoption of cotton as an article of dress, though it now forms the clothing of nine-tenths of the population.

On the first landing of the Spaniards in Mexico they found the cotton-plant extensively cultivated by the natives, who manufactured from it large quantities of cloth, specimens of which were sent by Cortez to the Emperor Charles V. It was likewise found wild in the island of St. Domingo and on the continent of South America. In the United States it is said to have been first cultivated by the Virginian planters, who were induced to enter upon this branch of industry from the depression in the price of tobacco occasioned by an act of the British Parliament. Up to the end of the last century, however, the export of cotton from America was extremely limited, as will appear from the following statement of the export of American cotton to Europe from 1785 to 1790:—

1785	14 bags.	1788	389 bags.
1786	6 ,,	1789	842 ,,
1787	109 ,,	1790	81 ,,

Compare the above with the fact that during the year 1871–72 there were exported to Europe and elsewhere 1,957,314 bales of cotton from the United States, while 1,097,540 bales were consumed in American mills. In 1870–71 the total quantity exported amounted to 3,166,742 bales, and the American consumption was 1,100,196 bales. Great Britain is by far the best customer of the United States in the article cotton. The following table will show the quantities imported into the United Kingdom from the States and other countries:—

Quantities of Raw Cotton Imported into the United Kingdom from various Countries.

Years.	United States.	Brit. W. Indies and Guiana.	Brazil.	Egypt.	Brit. Poss. East Indies.	China and Japan.	Other Countries.	Total.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1853	658,451,796	350,428	24,190,628	28,067,984	181,848,160	18,592	2,351,141	895,278,749
1860	1,115,890,608	1,050,784	17,286,864	43,954,064	204,141,168	3,920	8,611,344	1,390,938,752
1863	6,394,080	32,828,240	22,603,168	93,552,368	434,420,784	31,567,760	48,716,864	669,583,264
1865	135,832,480	19,814,480	55,403,152	176,838,144	445,947,600	38,838,688	105,303,784	977,978,288
1871	1,038,677,920	2,621,104	86,158,800	176,166,480	430,470,992	..	95,281,648	1,829,376,944

Of the quantity imported in 1871 only 368,234,160 lbs. were exported in the raw state, the balance being retained for home consumption. The total value of raw cotton imported in 1871 was £55,907,070. Total quantity imported in 1872, 1,408,837,472 lbs.; of which 625,600,080 lbs. was from the United States.

The subject of cotton has of late years attracted a considerable share of public attention, in consequence of the apprehensions which have been excited that from the increasing population of the world, and corresponding consumption of cotton goods, the supply might eventually fall short of the demand. More immediate anxiety, however, was created by the civil war in America, and the distress caused in the cotton districts of England by the consequent almost total interruption in the supply of cotton from that country. (See COTTON FAMINE.) In 1860, the year before the war, 1,115,000,000 lbs. of cotton, more than four-fifths of the total quantity consumed in Great Britain, were supplied by the United States. In 1863 not more than 40,000,000 lbs. came from the States (including in that estimate the cotton brought by blockade-running steamers, classed in the above table for the most part under the British West Indies). This failure of the American supply to our markets turned the public attention to other quarters of the globe, and more particularly to India, which may perhaps in some respects be considered as the cradle of the cotton plant, and almost every region of which, from the Himalayas to Cape Comorin, is well adapted for its cultivation. Much had already been done by the East India Company in the way of encouraging the cultivation of the plant; improved qualities of seed had been introduced from America and other countries, cotton plantations established in various places, and numerous attempts made to rouse the natives to a sense of the advantages they might derive from directing their energies to this branch of industry. The enhanced price in the English markets gave new force to such enterprises, a large increase in the production of cotton took place, and India may yet rival the productive powers of the United States. The extraordinary change in the amount obtained from China points out another important source of supply. From Ceylon, Borneo, and other East India Islands, large quantities might be obtained, a remark which is applicable with still greater correctness to the continent of Australia, and the colony of Port Natal in South Africa. A very promising field, likewise, is that which the researches of Dr. Livingstone have recently brought prominently before the public. On the banks of the river Zambesi in Eastern Africa, and the adjoining territory, the cotton plant is indigenous, and can be produced to any amount, of a fine quality; while the river, which is navigable to a considerable distance inland, presents a ready means of transit between the cotton-growing districts of the interior and the Indian Ocean. The discovery of such a territory seems calculated to allay the fears of those who dreaded an eventual shortcoming in the supply of cotton, and a consequent stagnation of British industry. Great attention has been paid to cotton cultivation in Egypt by the present pasha; the above table shows his magnificent success. Various

countries in the south of Europe, such as Spain, Sicily, &c., are adapted for the growth of the cotton plant. Bonaparte endeavoured to introduce its culture into France in 1807, but though the experiments made in several parts of the country were attended with a certain degree of success, they proved in a great measure abortive. In Algeria, however, the French have prosecuted this branch of industry since its introduction in 1851 with more success. For the manufacture of cotton, see COTTON-SPINNING.

COTTON, CHARLES, a burlesque poet of the seventeenth century, was born at Beresford Hall, Staffordshire, in 1630, and received his education at Cambridge, after which he travelled in France. In 1658 he inherited his father's estates, which lay near the river Dove, on the banks of which he built a fishing-house, in which he entertained for years his friend Izaak Walton. Not being of a very provident disposition he was subject to frequent embarrassments, and at one time was confined in prison for debt. He died at Westminster in 1687. His works are numerous, including Scarronides, or Virgil Travestie, being the first and fourth books of Virgil's Æneid, in rather indelicate burlesque, and a translation of Montaigne's Essays. After the death of Cotton a volume was published, entitled Poems on Several Occasions (8vo), which contains some pieces of considerable merit, chiefly of the light and humorous kind. He also translated Horace, a tragedy of Corneille; but the work by which he will be best remembered is the part which he added to the fifth edition of Walton's Complete Angler—Instructions how to Angle for a Trout and Grayling in a clear Stream.

COTTON, SIR ROBERT BRUCE, a celebrated English antiquary and collector of literary relics. He was born at Denton, in Huntingdonshire, in 1570, and after having been at Westminster School, completed his studies at Trinity College, Cambridge. He then settled in London, devoting much of his time to antiquarian pursuits, and employing himself especially in collecting ancient deeds, charters, letters, and other manuscripts of various kinds, illustrative of the history of England. He was one of the earliest members of the Antiquarian Society; and he not only promoted the general objects of that learned association, but also assisted with his literary treasures as well as with his purse Speed, Camden, and other writers on British archæology. In the reign of James I. he was knighted; and, on the institution of the order of baronets, he was promoted to that rank. In 1629 he was falsely accused of having written an obnoxious political tract, and was thrown into the Tower; yet although he succeeded in establishing his innocence, his library was sequestrated, and he ascribes his death to his being deprived of the company of his books. He died in May, 1631. For the history of his library see COTTONIAN LIBRARY.

COTTON FAMINE. The civil war in the United States, between 1861 and 1864, inflicted for the time a severe blow on the cotton industries of Europe, and especially on those of Lancashire, the most important cotton manufacturing district in the world. Before this war the European market had been almost entirely dependent on the southern states of the Union for its supply of raw cotton, and the result was that soon after the war broke out that supply was to a very large extent cut off. This was due partly to the destruction of great quantities of cotton, partly to the fact that less cotton was grown, and partly to the blockade of the Confederate ports, which threw great obstacles in the way of exporting what cotton the planters and dealers had on hand. The amount of cotton imported into England from America, which in 1860 had reached 2,421,500 bales (of 400 lbs.), sunk in 1861 to 1,841,500; in 1862 it was only 72,500; in 1863, 132,000; and in 1864, 198,000. The total supply of raw cotton which reached England from all quarters fell from 3,477,346 bales in 1860 to 1,309,925 in 1862. The result of this diminished supply was that the price of American cotton rose from 6½*d.* per lb. in 1860 to 27½*d.* per lb. in 1864, and other kinds of cotton rose in proportion. It so happened also that the two years previous to the outbreak of the American civil war (1859 and 1860) had been remarkable for the extraordinary activity of the cotton manufactures, and that the yarns and cotton goods manufactured during these years were considerably in excess of the demand; so that while the price of the raw cotton continued to rise, the price of manufactured cotton did not rise to anything like the same extent. There were thus two causes at work to produce stagnation in the cotton manufacture. First, the supply of cotton had sunk so low that it was totally inadequate to keep all the available spindle-power in England going; and secondly, there was scarcely any profit—for some time, indeed, no profit at all—to be derived from working up the raw cotton which was introduced into the country. The natural consequence was that many of the cotton spinning and weaving mills were closed entirely, a very large number remained open for only four or five days in the week, and comparatively few continued working without interruption. It is estimated that in 1862 there were in all 500,000 persons employed in the cotton manufacture in England, about 400,000 of whom were employed in Lancashire, while the total number of persons dependent on this manufacture might be taken to be about 1,000,000,—in Lancashire and the immediate neighbourhood, 800,000. Of the 400,000 mentioned as employed in Lancashire, more than 150,000 were, in the autumn, entirely out of employment, and more than 120,000 were working short-time. The loss in wages was estimated to amount to £105,000 per week. Before the end of the year matters were still worse. Active efforts were made by the Lancashire land-owners and others to relieve the distress that ensued. A 'Cotton District Relief Fund' was established in London, and a 'Central Relief Committee' in Manchester, and numerous local funds were established throughout the country. Subscriptions flowed in from all quarters, even from remote parts of the world. A Rate in Aid bill was passed empowering the government, by order in council, to give authority to parishes to raise money on the security of future rates for the purpose of relieving those who were thrown out of work by the cotton famine. Gradually the difficulties of this period were overcome. The price of manufactured cotton goods rose as the excessive supply was cleared off, and thus mill-owners were enabled to open their mills again with profit to themselves. At the same time the high price of raw cotton had a stimulating effect upon all cotton-producing countries in the world, and the supplies from India, Egypt, the Brazils, and elsewhere, which had previously been insignificant, rapidly and largely increased. It was several years, however, before the supply was able fully to overtake the demand. Even in 1870, according to a report made to the Liverpool meeting of the British Association in that year, the total probable supply of raw cotton was estimated at only 102,557 bales (of 400 lbs.) per week, while the spindle-power of Europe and the northern states of America was equal to a consumption of 109,639 bales per week. The following table, giving the number of bales imported into England from various countries in 1860, 1862, 1865, and 1866, will show the effect that the diminished production of the southern states of America had upon that of other countries:—

	From N.America.	From Brazil.	From Egypt.	From India.	From Europe.	From all parts.
1860	2,421,500	?	?	733,918	?	3,477,346
1862	72,500	134,000	132,000	1,072,000	35,000	1,446,000
1865	462,000	340,000	334,000	1,407,000	211,000	2,754,000
1866	1,163,000	423,000	180,000	1,867,000	153,000	3,786,000

The American bale is about 430 lbs.; the Egyptian, 384 lbs.; the Indian, 276 lbs.; and the Brazilian, 181 lbs.

COTTONIAN LIBRARY. This valuable collection of ancient manuscripts, books, and coins was commenced by Sir R. Cotton, and was much augmented by his son and grandson. An act of Parliament was passed in 1700 for the better securing and preserving this library in the family of the Cottons for the benefit of the public; it ordained that the mansion-house, where it had been placed, should be preserved for the use of the descendants of Sir R. Cotton for ever, and the library be publicly accessible. In 1712 the collection was removed to Essex House, in the Strand, where it remained till 1730, when it was deposited in a house in Little Dean's Yard, Westminster. On the 23d October, 1731, a fire broke out here, whereby 111 manuscripts were burned, lost, or entirely defaced, and ninety-five rendered imperfect. It was then removed to a new building originally designed for the dormitory of Westminster School; in 1757 it was finally removed to the British Museum. The act under which the museum was founded directs that two trustees, to be nominated in succession by the members of the Cotton family, should be for ever added to those appointed by the same act for the general execution of its purposes. Camden, Raleigh, Bacon, Seldon, Lord Herbert, and many other historians, have been much indebted to the Cottonian Library for very valuable materials, and even the researches of recent historians has not exhausted all its treasures.

COTTON-SPINNING. Up to the middle of the last century the only method of spinning known was that by the hand-wheel, or the still more primitive distaff and spindle. In 1738 John Wyatt, of Birmingham, took out in the name of a Mr. Lewis Paul a patent for a spinning-machine, working by means of rollers. The experiment, however, proved unsuccessful; the projector suffered considerable pecuniary loss, and in the course of a few years the machinery was disposed of. It has been maintained that the invention of Wyatt, the principle of which appeared some years afterwards developed to a greater extent in the spinning-machine of Arkwright, was borrowed by the latter from the former. At the present time it is almost impossible to determine the merits of such a question, but this at least appears to be certain, that to Wyatt must be ascribed the honour of having invented the *first* spinning-machine. In 1767, or according to others two years earlier, a poor weaver of the name of Hargreaves, residing at Stanhill, near Blackburn, in Lancashire, invented a machine for spinning cotton, which he named a *spinning-jenny*. It is said the discovery was first suggested to him by a spinning-wheel, while in motion, being one day accidentally overturned in his house. The thread still remaining in the hand of the spinner, Hargreave's attention was attracted by the circumstance of the spindle continuing to revolve by the velocity of the wheel while the latter preserved its horizontal position. The spinning-jenny thus invented by him consisted at first of eight spindles, turned by a horizontal wheel, but was afterwards greatly extended and improved, so as to have the vertical substituted for the horizontal wheel, and give motion to from fifty to eighty spindles. Popular prejudice, however, began to be excited against Hargreaves shortly after his discovery being made known; a lawless mob burst into his house and destroyed his machine, and he was obliged to remove from Lancashire into the county of Nottingham, where he ultimately, in partnership with a Mr. James, erected a cotton mill, and died in 1778. It has been generally asserted that he died in the workhouse, or at least in great poverty, but this appears to be erroneous. In 1769 the celebrated Arkwright, originally a barber's apprentice, took out a patent for spinning by rollers, the machine bearing in many respects a strong resemblance to that introduced about thirty years before by Wyatt. From the circumstance of the mill erected by Arkwright at Cromford, in Derbyshire, being driven by water-power, his machine received the name of the *water-frame*, and the thread spun on it that of *water-twist*. The next important invention in cotton-spinning was that of the *mule*, introduced by Mr. Samuel Crompton, of Bolton, in 1775, and so called from its combining the principle of the spinning-jenny of Hargreaves with the roller-spinning of Arkwright. In point of importance it has perhaps contributed more than any other discovery to the extension of the cotton trade. It has also enabled the manufacturer to produce yarns of a much greater degree of fineness than could be made with Arkwright's machine, and so much were these prized at the first period of the invention of mule-spinning, that they were sold to the muslin manufacturers of Glasgow at twenty guineas a pound. Numerous improvements in cotton-spinning have been subsequently introduced up to the present day, but they are all, more or less, modifications of Arkwright's spinning-frame and Crompton's mule-jenny. Among the principal of these may be mentioned the *throstle*, an extension and simplification of the original spinning-frame, introduced about the year 1810. In this machine the construction is essentially the same as in Arkwright's spinning-frame, but the moving apparatus is considerably simplified, so as to increase the speed of the machine, and enable a greater number of spindles to be driven with the same amount of power. The throstle is generally used for the spinning of warps of low numbers, the relative fineness of cotton yarn being expressed by numbers, thus, No. 32, No. 40, No. 80, &c., signifying that of the particular kind of yarn so many hanks are required to make a pound. The length of each hank is 840 yards. Yarn of a finer quality than No. 36 cannot well be spun on the throstle, being unable to bear the pull of the rollers in winding itself upon the bobbin; whilst on the mule, where no bobbin is used, and the yarn is wound upon the spindles without subjecting it to any strain, warps of the finest quality can be produced. An important improvement likewise in mule-spinning was introduced in 1792 by Mr. Kelly, of Lanark, in effecting the working of the mules by machinery, instead of the hand, as formerly. A still further diminution in the labour of working these machines was effected by Messrs. Sharp and Robarts, of Manchester, whose self-acting mules do not require the manual assistance of a spinner, but merely the attendance of children, as piecers, to join such threads as may be accidentally broken. Nor, in thus taking a review of the history of cotton-spinning, ought we to forget the immense assistance afforded it in its progress by the invention of the steam-engine, the varied powers of which have effected so extensive a revolution in almost every branch of human industry.

Having thus given a general history of cotton-spinning from the first introduction of spinning by machinery up to the present day, we now proceed to give a detailed account of the process.

There are one or two operations which the cotton must pass through, however, previous to those properly connected with the spinning of it. The first of these is the *sorting*. The cotton contained in different bales differs somewhat in quality, and since the yarn to be spun from it must be of uniform quality, the cotton requires to be sorted in order that uniformity of thread may be attained. For this purpose the cotton from one bag is spread over a certain space on the floor, the cotton from another is spread over the first, that from a third over the second, and so on; the layers of cotton being trodden down by men and boys while the *bing*, as it is called, is forming, just like hay in a hay-stack. Cotton is taken from the bing by means of a kind of rake which is dragged down the side of the bing from top to bottom, and thus draws out a certain portion from all the different layers. By mixing different qualities of cotton together in this way, yarns of various degrees of fineness may be obtained, or a weak stapled quality may be made, by judicious mixture, to work into good yarn.

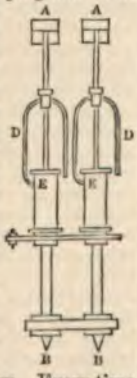
The cotton now requires to be cleaned from the mud, sand, and other impurities which it still contains. This is done by the *willow*, which consists of a conical wooden beam studded with spikes, revolving with great rapidity in a case or box also having spikes fixed inside it. The cotton is put in at the narrow end of the cone, and is wafted onwards to the other end, the heavy impurities falling through a grating below, the lighter being carried off by the action of a revolving fan. The cotton is still farther opened and cleaned by the scutching-machine, or the 'blower' or 'opener,' into which it is fed between two rollers, beaten by rapidly revolving beater-bars, carried forward by endless aprons, and, having the remaining impurities sucked out of it by means of revolving fans, is conveyed to the spreading or *lapping* machine. By this machine the cotton is brought into the form of a compressed fleecy layer of wool called a lap, which, by means of an endless apron, is wound round a cylinder, and is then ready for the next process, viz. that of *carding*.

For fine yarns the laps are prepared by hand, and their preparation for the carding-machine is a work of some nicety, since, if the cotton is spread irregularly, the yarn may not be of uniform thickness. The operation of carding is intended to disentangle the filaments from each other, and to stretch them out lengthwise—for they still remain doubled up and involved, and to free them from any impurities that they may still retain. A card consists essentially of a kind of wire brush made of bands of leather, or of alternate layers of cotton, linen, and india-rubber, in which are fixed numerous teeth of hard-drawn wire, all bent exactly in the same way. All the teeth must be of the same size, and must be placed at equal distances; and if belonging to a carding cylinder, must all be equally inclined to the drum, round which the cards are fastened. Automatic machines of great ingenuity have been invented for the purpose of making cards, and greater exactness in the size and shape of the teeth is obtainable by them than in hand-made cards. A carding-machine consists of one or more cylinders covered with these toothed bands, and a set of plain surfaces similarly covered, made to work together so that the points of the teeth all but come in contact. The carded cylinders or rollers are made to move in opposite directions and with different velocities, and by the time the cotton has passed through them it has been transferred from the one to the other, and its fibres all drawn out parallel. Pl. XXXIV. shows a patent self-stripping carding-machine, made by Messrs. Dobson and Barlow, of Bolton. The fleecy sheet of cotton called the lap is gradually unrolled, and fed in at that end of the machine which corresponds with the left side of the plate, and is immediately seized by a teethed roller called the *licker-in;* the cotton is there acted on by the large cylinder or drum, by smaller cylinders, and by the teethed *flats* at the top of the machine, and at last reaches the *doffer*, a pretty large drum card, seen at the other end of the machine. The doffer moves slowly in contact with the large cylinder, but in an opposite direction, and thus becomes covered with a fleecy web of cotton, which is removed from it by the doffing knife, a steel blade with a toothed edge like a fine comb. This fleece of cotton is of course as broad as the doffer is long, but it is immediately contracted by being passed through a kind of funnel, and between pairs of rollers; and it leaves the machine in the form of a narrow riband, called a *card end* or *sliver*, which is either let fall into a tin can placed to receive it, or wound upon a large bobbin. In spinning fine yarns two carding engines are used, the first called a *breaker-card*, and the second a *finishing-card*. The machine of which we give an engraving may serve as a breaker-card for fine numbers, or a finishing-card for coarse numbers. It is usually made 40 inches wide, with the cylinder 40 inches in diameter, the doffer 20 inches, and the licker-in 9 inches. This machine is fitted with an apparatus for cleaning the flats, which are liable to get filled up with dirt and short fibres; and, by an improvement patented by the makers, the flats most liable to get filled up (those nearest the licker-in) are cleaned oftener than the others. The inventor of the carding-engine is not certainly known; but in 1748 Mr. Lewis Paul, already mentioned, patented two machines for carding, in one of which the cards were arranged on a flat surface, in the other on a drum. The cardings were taken off separately by a movable comb, and the machines had to be stopped every time that this was performed. One of the earliest improvements was the fixing of a revolving cloth or feeder to the machine, on which a given weight of cotton was spread. Arkwright introduced the plan of rolling up the feeder and allowing it to gradually unroll to feed the machine. Some also attribute to him the invention of the comb mechanism for stripping the cotton from the doffer. In his time, at all events, the carding-engine existed in its essential parts, though some improvements have since been introduced.

Even when the cotton has passed through the cards its fibres have not been sufficiently straightened, and to complete this part of the process, which is necessary to the formation of good yarn, it is next carried to the drawing-frame, which likewise doubles the ends that have come from the carding-engine. The drawing-frame acts on a very simple and ingenious principle. Two or more ends are taken from the cards and passed through between a pair of rollers in motion, and, being carried forward, pass through another pair revolving at a greater velocity, and usually through a third pair revolving at a still greater velocity, after which, being collected and passed in one mass through another pair, they are delivered in one thread at the other end of the machine. Now the velocity of the second pair of rollers being greater than that of the first, and of the third greater than that of the second, they would take up more cotton than is delivered to them, in consequence of which the whole is stretched, and thus several ends are combined and delivered no thicker in grist than any of those first introduced into the machine. The doubling is a most essential part of the process. For coarse numbers six card-ends are usually united into one riband; six of these again into one; six of these into a third; and five of

these last are finally united into one. Thus the doubling of the fibres has been multiplied $6 \times 6 \times 6 \times 5 = 1080$ times. 'Were the drawing of a single sliver attempted to be continued till the suitable parallelism of its filaments were effected, it would ere long become an impossible operation on account of the excessive attenuation of the riband. This inconvenience is obviated by the very simple method of associating at each repeated drawing several of the formerly-drawn slivers together into one riband; this is the process called *doubling*. It is an accurate imitation of what happens when we take a little cotton-wool between the fingers and thumb of one hand, and draw it out with those of the other, at each turn laying the two parcels parallel again. The doubling secures the great advantage of causing the unequal parts of slivers to correct one another, and to produce, finally, a very uniform riband.' Pl. XXXV. contains an engraving of a drawing-frame of the most recent type, by Platt Brothers & Co., Oldham. The cans contain the sliver while it is passing into the machine, or receive it when it comes out at the other side.

The cotton has now the appearance of a loose porous cord, with its fibres lying parallel. It is too thick to be spun into yarn, and too tender to be further reduced by drawing as it is; it therefore has to receive a slight twist, which, by condensing the fibres, enables the drawing to be proceeded with. This next process is called *roving*, and is really the commencement of spinning, which, in a cotton-mill, is little more than a combination of drawing and twisting. The roving-frame of Arkwright resembled the drawing-frame, but the sliver was received into a revolving can, which gave it the necessary twist, and converted it into the roving. This was superseded by the *jack-frame*, and the latter by the *bobbin-and-fly frame*, which, greatly modified and improved, may be considered as the roving-machine of the present day. Fine threads require to be passed through several of these machines, of one of which we give an engraving (Pl. XXXVI.), a *finishing-roving machine*, by Messrs. Platt Brothers & Co. These machines have to accomplish three things: to reduce and draw out the roving, to twist it, and, lastly, to coil it regularly and evenly on the bobbin. The bobbins containing the sliver (or the roving) are mounted on a shelf; from these it passes to the drawing rollers, the action of which will be understood from what we have already said; it is then received by the spindles, which are arranged in two rows, and, by means of the bobbin-and-fly mechanism, is twisted and wound on the bobbin. The action of the bobbin-and-fly will be understood from the accompanying cut. The rove is supposed to come through between the rollers at A, and is made to pass through an eye at the top of the fork D, which is called the *fly* or *flyer*, and revolves with the shaft A B. One of the legs of the fly is made hollow, and the rove, entering it at the top, passes through and is delivered upon a bobbin at E, and by the rapid revolution of the flyer receives a slight twist. It will be seen that the roving, in being wound upon the bobbin, must always be kept at an equal degree of tension. That the bobbin E may be built regularly, it is necessary that it should move up and down on the spindle A B, which is effected by a contrivance connected with the machinery. Every time that the bobbin moves up or down its thickness is increased by a new layer of roving, and it will thus require a longer line of the cotton delivered by the flyer to go round it. The flyer would therefore require to increase in speed as the bobbin fills, or the bobbin to decrease, or else the roving would be stretched and injured. By an ingenious arrangement, which we have not space to describe, the speed of the bobbin is made gradually to decrease, as well as the extent of its upward and downward motions, so as to finish it with conical ends.



The rovings are now ready for the last operation—that of converting them into yarn. This is done by means of the *throstle*, which makes throstle-yarn or *water-twist;* or by the *mule* or *mule-jenny*. This complicated machine is furnished with drawing-rollers, and with a movable frame or carriage moving upon iron rails, and containing as many spindles as there are threads to be spun. This carriage moves forward, drawing and twisting the thread as it does so, until it has reached the end of its course and stretched the threads as much as they will stand; it is then stopped, the spindles still revolving and twisting the threads; and, finally, it is drawn back again, winding up the yarn all the time. Pl. XXXVII. will give some idea of this machine.

In the above article a description has been given of the various stages in the preparation of the cotton wool up to its transformation by the spinner into yarn or thread. For the process of converting the yarn into textile fabrics see WEAVING.

A return presented to the House of Commons in 1871 gives the number of cotton factories in the United Kingdom, and of hands employed in them, as follows:—

	England.	Scotland.	Ireland.
Factories employed in spinning only,..	1085	20	3
" employed in weaving only,..	649	36	8
" employed in spinning and weaving,.....	513	17	2
Factories not included in either of the above descriptions,.....	124	25	1
Total,.....	2371	98	14
Total number of hands employed,	414,970	30,960	4157

In M'Culloch's Commercial Dictionary it is estimated that, 'allowance being made for old and infirm persons, children, &c., dependent on those actually employed in the various departments of the cotton manufacture, and in the construction, repair, &c., of machinery and buildings required to carry' the cotton manufacture 'on, it must furnish subsistence for from 1,000,000 to 1,200,000 persons!'

Lancashire in general, and Manchester and Salford in particular, are the chief seats of the cotton manufacture in this country; and the population of these and other neighbouring towns has, with the advance of the cotton manufacture, increased at an extraordinary rate. Liverpool owes its greatness in a considerable degree to the fact of its being the grand emporium of the cotton district. The whole of Lancashire had 761 factories employed in spinning only in 1871, 550 employed in weaving only, 392 employed in both spinning and weaving, and 86 not coming under either of the other descriptions. The value of manufactured cotton (including yarn under that term) exported from the United Kingdom in 1872 was £80,164,155. White piece-goods formed the largest item in this sum, their value amounting to £34,842,628; the printed cottons were of the value of £23,360,694; the cotton yarn £16,697,426.

COTTUS. See BRIAREUS.

COTYLEDONS, the seed-leaves or seed-lobes of the embryo-plant, which serve it as organs of nutrition until the young vegetable is established in the soil and develops its true leaves. In flowering plants there are two kinds of embryos—one in which there is only a single cotyledon, and the other in which

there are two cotyledons. In the first division, that of monocotyledonous plants, including the palms and grasses, the leaves or fronds are straight-veined, and when wood is deposited, as in palms, the growth is inside of the stem, and hence the plants are named Endogens, or inside-growers. The second division consists of dicotyledonous plants, including the trees and shrubs of this country and of temperate climates generally; the venation of the leaves is reticulated, the wood is deposited in concentric rings round the central pith, and hence the plants are named Exogens, or outside-growers. The lower class of plants, producing spores or cellular embryos having no cotyledons, are called acotyledonous. During germination the cotyledons either rise above-ground and appear as temporary leaves of a peculiar shape, as in the radish, turnip, lupin, hazel, maple, &c., or they remain under ground as fleshy lobes, yielding nourishment to the young plant till their substance is absorbed, as in the bean and pea. The cotyledons of balsam ascend the stem to a considerable height. The Welwitschia, a South African plant, discovered in 1860, never possesses any other leaves than the cotyledons, which, instead of fading and giving place to ordinary leaves, are permanent, and attain to a length of 6 feet and a breadth of 2.

COTYS, or COTYTTO, a goddess of debauchery, worshipped at Corinth and Chios. Her festival was called *Cotyttia* or *Cotyttis*, and was celebrated during the night (in what way is easily to be inferred from the character of the goddess) at Athens, Corinth, Chios, in Thrace, &c. Cotys is probably the same with the goddess of the Edoni in Thrace.

COUCH (QUITCH, or QUICK) GRASS (*Triticum repens*), a perennial grass, which is propagated both by seed and by the root, and is one of the most common and troublesome weeds of agriculture. When it first appears above-ground its blade is readily eaten by sheep. It afterwards sends up a seed-stem with alternate floscules, each of which bears three or four seeds, protected by a long pointed chaff. In arable land, however, under any tolerable management, the seeds are never allowed to ripen, and the propagation is effected by the numerous joints of the long trailing root, each joint sending forth a shoot, which becomes a new parent plant. So rapidly does it spread that some farmers have adopted the idea that certain lands breed couch, and thus furnish themselves with an excuse for not attempting sedulously to extirpate it on the ground that is only fruitless labour. The proper time for extirpating it is in summer, when the land is undergoing a pure fallow, or, where fallow is not used, when the land is being prepared for a root-crop. The most effectual means are a deep ploughing, going below the roots of the plant, a diligent use of the roller, grubber, and ordinary harrows, and careful hand-picking. The roots when collected are either burned in heaps or converted into a compost by mixing them with hot lime. Both methods have been censured on the ground that the roots might be turned to more profitable account. They are readily eaten by pigs, and when cleaned and boiled or steamed become a farinaceous and nutritious food for cows and horses. They are also not without use as a medicament. When stripped of the outer pellicle, and freed from the fibres issuing from its joints, couch-grass forms, in composition with liquorice root, an excellent demulcent decoction. It is the grass eaten by dogs as a vomit.

COUCHING, a surgical operation, that consists in removing the opaque lens out of the axis of vision by means of a needle constructed for the purpose.

COUCY, RENAUD, CHATELAIN DE, was the hero of a tragical occurrence which has been often celebrated in ancient ballads and songs. He is supposed to have been the nephew, or at least the kinsman, of Raoul, lord of Coucy, who accompanied Philip Augustus to the Holy Land, and with whom he has been sometimes confounded. A manuscript in French verse, in the Royal Library at Paris, entitled Romance of the Castellan of Coucy and the Lady of Fayel, written about 1228, and a chronicle on the same subject, in 1380, in the possession of Fauchet, relate the following story:—Renaud, castellan of Coucy, was smitten with the charms of Gabrielle de Vergy, lady of Aubert de Fayel. The castle of Fayel was situated not far from Coucy, in the neighbourhood of St. Quentin. Renaud threw himself at the feet of Gabrielle, confessed his passion, and was at first repulsed, but not for ever. The lovers often saw each other in private. Assurances of the most ardent love, and unceasing precautions against the jealousy of the husband, gave occasion to the songs of Renaud, of which a collection has been preserved to us, breathing the language of the most glowing passion. The happiness of the parties was interrupted by the summoning of Coucy to the Crusade. He embarked with Richard of England at Marseilles. With him he fought at Cæsarea, and conquered at Ascalon. But in defending a castle where the king was quartered he was wounded by a poisoned arrow. The wound proved incurable, and Renaud requested leave to return to his country, which was granted. But in a few days he felt sensible that his end was approaching; and giving to his faithful squire a silver casket, with the presents of his mistress, 'Take it,' he said, 'and guard it well; when I am dead, inclose my heart in this casket, and bear the whole to the Lady of Fayel.' He also added a letter, which he was hardly able to sign. He died, and his faithful squire hastened to the castle of Fayel. He was surprised by the lord of the castle, who, suspecting his appearance, ordered him to be searched, and found on him the gifts and the letter of Coucy. Burning with rage, he determined on revenge. He ordered the heart to be served at table. It was done, and Gabrielle ate of it. 'Have you found the dish to your taste, madam?' he asked. 'Excellent!' answered his victim. 'I doubt it not,' he replied; 'it must have been a dainty morsel for you, for it was the heart of the Castellan of Coucy.' In fearful confirmation of his words he gives her the letter of the dying Renaud. The unhappy woman, after this horrible meal, refused all sustenance, and died of voluntary starvation. The love-songs of the Castellan of Coucy are in the Mémoires historiques sur Raoul de Coucy (Paris, 1781), in the ancient dialect, with a translation subjoined, and old music. Uhland has made this story the subject of a fine ballad.

COUGAR. See PUMA.

COUGH, in medicine, a deep inspiration of air, followed by a sudden, violent, and sonorous expiration, in a great measure involuntary, and excited by a sensation of the presence of some irritating cause in the air-passages. The organs of respiration are so constructed that every foreign substance, except atmospheric air, offends them. The smallest drop of water entering the windpipe is sufficient to produce a violent coughing, by which the organs labour to expel the irritating substance. A similar effect is produced by inhaling smoke, dust, &c. The sudden expulsion of air from the lungs is produced by the violent contraction of the diaphragm and the muscles of the breast and ribs. These parts are thus affected by a sympathy with the organs of respiration, which sympathy springs from the connection of the nerves of the different parts. The sensation of obstruction or irritation, which gives rise to cough, though sometimes perceived in the chest, especially near the pit

of the stomach, is most commonly confined to the *trachea*, or windpipe, and especially to its aperture in the throat, termed the *glottis*. Yet this is seldom the seat of the irritating cause, which is generally situated at some distance from it, and often in parts unconnected by structure or proximity with the organs of respiration. Of the various irritations which give rise to cough, some occur within the cavity of the chest; others are external to that cavity; some exist even in the viscera of the pelvis. Of those causes of cough which take place within the chest, the disorders of the lungs themselves are the most common, especially the inflammation of the mucous membranes, which excites the catarrhal cough, or common cold. This disease is generally considered unimportant, particularly if there be no fever connected with it. But every cough lasting longer than a fortnight or three weeks is suspicious, and ought to be medically treated.

Pleurisy, or inflammation of the serous membrane which covers the lung and lines the interior of the chest, also gives rise to cough, this disease being almost invariably accompanied by inflammation of the outer layer of the tissue of the lung. It may be simple, but is very frequently associated with tubercular phthisis. Another common cause of cough which has its seat in the chest is inflammation of the lungs. In this disease there is inflammation of the tissue of the lungs, with exudation of fibrin, which solidifies the lung and shuts up the air-cells. Much constitutional disturbance accompanies it. Even after the acute inflammation may have subsided, a cough attended with extreme danger sometimes continues to be excited by collections of pus, or abscesses, which ensue in the substance of the lungs, and either terminate in consumption, or suffocate the patient by suddenly bursting; more rarely the pus is discharged gradually from a small aperture, and the patient recovers. In such cases the fever, originally acute, is converted into a hectic, with daily chills, succeeded by heat and flushing of the face, night sweats, and emaciation. Another frequent origin of cough is the rupture of some of the blood-vessels of the lungs, and the consequent effusion of blood into the cells, which is expelled by the cough that its irritation excites, constituting what is technically termed *hæmoptoe*, *hæmoptysis*, or spitting of blood. When the vessels of the lungs are thus ruptured they seldom heal readily, but degenerate into ulcers, which pour out a purulent matter; and by this discharge the vital powers are gradually worn down and destroyed. This is a common source of consumption, or *phthisis pulmonalis*. (See CONSUMPTION.) A cough is excited, and the same fatal disorder is also induced, by the existence of tubercles in the lungs. These are little tumours which gradually inflame and ulcerate, and produce the same consequences as the ulcerations from *hæmoptysis*.

There is yet another source of irritation within the lungs, of which cough is an attendant, namely, an effusion of *serum* into the parenchymatous substance of the lungs, or into the cellular membrane which connects the cells and blood-vessels together. This has been called *anasarca pulmonum*, or dropsy of the lungs, and is marked by great difficulty of breathing, with a sense of weight and oppression in the chest, occasioned by the compression of the air-cells and vessels by the accumulated water; hence also great irregularity of pulse, frightful dreams, imperfect sleep, &c., are among its symptoms. Inflammation of the heart and of the *pericardium*, or membrane surrounding it, is also accompanied by cough, and other symptoms not easily distinguishable from those of pleurisy and peripneumony. Where a cough is excited by disorders of parts external to the cavity of the chest, it is generally dry, as the irritating cause is external, and not any obstructing matter in the lungs themselves. Disorders of the viscera of the abdomen, especially of those which lie in contact with the diaphragm (the muscular curtain separating the cavities of the belly and chest), frequently induce a cough. A short, dry cough invariably attends inflammation of the liver, whether acute or chronic, and accompanies the various tubercular and other obstructions in that organ. Hence inflammation of the liver is not unfrequently mistaken for inflammation in the lungs; and in some of the chronic diseases of the liver the cough is occasionally complained of as the most urgent symptom. The presence of pain in the right side, shooting up to the top of the shoulder, the dryness of the cough, and pain, enlargement, hardness, or uneasiness on pressure below the ribs of that side, will afford the best means of distinguishing whether a disease of the liver is the origin of the cough. Disorders of the stomach are also often accompanied with a cough of the same dry and teasing nature, especially when that organ is over distended with food, or is in the opposite condition of emptiness. A short cough is, therefore, a frequent symptom of indigestion and hypochondriasis, or of that weakness of the stomach which is popularly termed *bilious*. In short, there is scarcely any one of the viscera in the cavity of the abdomen, the irritation of which, in a state of disease, has not excited cough. Disorders of the spleen, pancreas, and even the kidneys, have all given rise to this symptom; and external tumours attached to them have had the same effect. Any distension of the abdomen, which, by its pressure upwards, impedes the descent of the diaphragm, and consequently the expansion of the lungs, occasions cough. Thus, in the *ascites*, or dropsy of the belly, the water—in tympanites, the air; in corpulency, the fat in the omentum; and in pregnancy, the gravid uterus—all have the effect of exciting cough in many constitutions. The variety of causes from which coughs may arise must convince every reader of the absurdity of attempting to cure all kinds of cough by the same remedy.

COULOMB, CHARLES AUGUSTIN DE, born 1736 at Angoulême; entered the corps of engineers; was sent to Martinique, where he constructed Fort Bourbon. His theory of simple machines obtained the prize offered by the Académie des Sciences. He subsequently obtained two other prizes, and was afterwards chosen a member of that body. He became a member of the Institute from its origin, and was Inspector-general of the University. He was especially distinguished for his investigations in electricity. By means of an ingenious instrument of his own invention he demonstrated the law according to which electric attraction and repulsion varies with distance. In 1784 he was made intendant-general of waters and fountains of France. The journals of the Académie des Sciences contain some valuable contributions by him. At the revolutions he gave up his offices and devoted his leisure to science. His investigations are much praised for ingenuity and accuracy. He died Aug. 23, 1806.

COUMARIN. This body exists in small crystals in Tonka-beans, from which it can be extracted by boiling in strong alcohol, decolorizing, and crystallizing the solution. It is found also in woodruff, which is one of the ingredients of the German beverage *Maitrank*, and in several other plants. It is colourless, forms sometimes large trimetric prisms, is hard, and breaks with a smooth fracture. It melts readily, but boils only at a high temperature. It has an aromatic odour, and is, therefore, often added to snuff, and a bitter, warm, and pungent taste. It is insoluble in

cold, but readily soluble in boiling water, and in alcohol. It is acted on by most chemical re-agents, yielding a variety of decomposition and substitution products. Coumarin has been prepared artificially, the proximate materials being acetic anhydride and sodium salicylol. When these react an oil is produced, which on distillation separates into several bodies, crystals finally forming in the retort; and these, when purified, are found to be identical with natural coumarin. In sufficiently large doses (60 to 70 grains) coumarin produces long-continued nausea, vomiting, weakness, giddiness, and desire to sleep. Much smaller doses (10 grains) produce narcotic and even fatal effects on some animals.

COUMASSIE. See COOMASSIE.

COUNCIL (from the Latin *concilium*), an assembly met for deliberation, or to give advice. The term specially applies to an assembly of the Church of Rome. Provincial councils were held as early as the second century, that is, synods consisting of the prelates of a single province. The assembled bishops and elders deliberated on doctrines, rites, and church discipline, and promised to execute the resolutions of the synod in their churches. These assemblies were usually held in the capitals of the provinces (metropolis), the bishops, or *metropolitans*, usually presiding over their deliberations. The councils had no other legislative authority than that which rested on the mutual agreement of the members. After Christianity had become the established religion of the Roman Empire, in the beginning of the fourth century, the emperor summoned councils, which were called *œcumenical*, that is, universal councils, because all the bishops of the empire were invited to them. Among these, the most remarkable are, 1, the Council of Nice, in 325, by which the dogma respecting the Son of God was settled; 2, that of Constantinople, 381, by which the doctrine concerning the Holy Ghost was decided; 3, that of Ephesus, 431; and 4, that of Chalcedon, 451; in which two last the doctrine of the union of the divine and human nature in Christ was more precisely determined. In the fourth century the opinion arose that the councils were under the particular direction of the Holy Ghost; hence the great authority which their resolutions obtained. Like the Roman emperors, the German kings exercised, at first, the right of assembling synods; in particular, Charlemagne, during whose reign the clergy of the Frankish empire held a council at Frankfurt-on-the-Main in 749, which condemned the worship of images introduced among the Greeks. In the middle ages the popes maintained the right of summoning general councils, although the Western Church was separated from the Greek. The principal of these Latin councils are that of Clermont (1096), in the reign of Urban II., in which the first crusade was resolved upon, and some later ones in which a reunion with the Greeks was attempted. In consequence of the great schism towards the end of the fourteenth century, which gave rise to at first two, and afterwards three, candidates for the Papal throne, the Council of Pisa was convened in 1409, which declared that the popes were subordinate to the general council, and condemned the schismatic candidates. After the dissolution of the Council of Pisa, without having terminated the schism, the Council of Constance, the most numerous of all the councils, was held in 1414. It revived the principle that a general council is superior to the pope, adjusted the schism, and pronounced the condemnation of John Huss (1415), and of Jerome of Prague (1416). The Council of Basel, in 1431, asserted the same principle, and intended a reformation, if not in the doctrines, yet in the constitution and discipline of the church. At the time of the Reformation the Protestants repeatedly demanded a general council; even the emperor, and the states which had remained faithful to the old doctrine, thought it the best means for restoring peace to the church. But the popes, recollecting the decisions at Pisa, Constance, and Basel, so disadvantageous to their authority, constantly endeavoured to evade it. At length the pope could no longer resist the importunities of the emperor and the states. He summoned a council at Trent, which began its session in 1545, and laboured chiefly to confirm the doctrines of the Catholic Church against the Protestants. On the 8th of December, 1869, an œcumenical council, summoned by a bull of Pope Pius IX., assembled at Rome. Out of 921 prelates summoned to the meeting, 767 were in attendance. Its sittings were suspended on 20th October, 1870, in consequence of the occupation of Rome by the national Italian troops. This council adopted a dogmatic Decree or *Constitutio de Fide*, and a *Constitutio de Ecclesia*, the most important article of which latter was that contained in the fourth chapter, which declares the infallibility of the pope when speaking *ex cathedrâ*, that is, when in discharge of his pastoral office he defines a doctrine regarding faith or morals to be held by the universal church. Some of the opponents of this dogma take their stand on the fact that the council was not dissolved, and that its decrees are consequently not yet final.

The Lutherans have never settled their church concerns by councils; but in the Calvinistic churches many particular synods have been held, among which, that of Dort (1618), which confirmed the peculiar opinions of Calvin on election, in opposition to the Arminians, is distinguished. The Protestant councils could never have the same authority as the Catholic in matters of doctrine, for the Protestants do not consider their clergy as constituting the church.

COUNCIL, AULIC. See AULIC.

COUNCIL, PRIVY. See PRIVY-COUNCIL.

COUNCIL AND SESSION, LORDS OF, the supreme judges of the highest court of Scotland. See SESSION (COURT OF).

COUNCIL BLUFFS, a city, United States, Pottawattamie county, Iowa, on the left bank of the Missouri, opposite Omaha city. The name is derived from a council held here with the Indians in 1804. In April, 1847, the Mormons, who had been violently expelled from this place, consisting of 143 men, 2 women, and 2 children, took a hitherto unexplored direction to the N.W., and formed the pioneers of the new Mormon settlement of Utah. Pop. 10,020.

COUNCIL OF STATE (*Conseil d'état*), under the French monarchy and empire was the chief administrative council of the state. It was instituted by Philippe le Bel, under the name of *haut conseil*. It consisted under the monarchy of magistrates and statesmen selected by the sovereign to give advice on the affairs of state. Napoleon reorganized the council, and extended its duties. Under him and the second empire it consisted, besides members of the imperial family, of the chief functionaries of state in the different departments of public service, war, marine, public works, &c., and was intrusted with the elaboration of projects of law to be submitted to legislative chambers, and with the defence of these projects before the chambers.

COUNSEL, or COUNSELLOR, a person retained by a client to plead his cause in a court of judicature. (See BARRISTER and ADVOCATE.) The term counsel is used as a plural for a number of legal counsellors engaged together in a case.

COUNT, COUNTEE, or COUNTY (from the Latin *comes*), appears to have been first used, as a title

of dignity, under the reign of Constantine. During the existence of the republic the inferior officers, as *tribuni*, *præfecti*, *scribæ*, *medici*, *haruspices*, *accensi*, *præcones*, who accompanied the *proconsules* and *proprætores* into their provincial governments, were known as the *comites* or *cohors* of their provincial. (Cic. pro. Rab. Post. 6.) On the establishment of the imperial government the name was applied to the court and household of the prince; and Dio (53) mentions a council of senators selected by Augustus as his *comites*. (Salmas. ad Sueton. Tib. 46.) On the first distribution of his dominions, and the foundation of the new capital by Constantine, ten out of thirty-five provincial generals received the title of *comes*. The civil officers, likewise, who were honoured with this distinction, gradually became very numerous, and lists of them may be found in the Cod. Theod. vi. 12–20, in the Notitia Imperii, and in the glossaries of Spelman and Du Cange. After the fall of the Roman power the title was retained by the conquerors; and under Charlemagne it denoted equally a military or civil employment. About the end of the fifteenth century, in Germany, and under the last princes of the Merovingian race in France, the title appears to have become hereditary in families, from the weakness of the crown, which was unable to recall the dignity that it had once bestowed. Selden, in his Titles of Honour, treats the origin and progress of the title at much length, and with his usual learning. Such is the account usually given of the origin of the counts of modern times. The institutions of the ancient German tribes may, however, have contributed much to the establishment of this class of nobles. In early times, before the existence of the Latin *comites*, the Germans had officers chosen, at least in some tribes, by the people. These were a kind of inferior judges. After the Franks became the ruling nation they made a change in their character. The king now appointed them, and they exercised jurisdiction over certain districts in the king's name, with the title of *Grafen*. These ancient officers are perhaps as fairly entitled as the *comites* to be considered the root of the subsequent *counts*. The German title *Graf* corresponds to the title *count* in other countries of Europe. These *Grafen* superintended the administration of justice, the police, and the taxes. After the time of the Carlovingian dynasty different classes of counts or *Grafen* were formed; thus *pfalzgrafen*, or *comites Palatii*, the judges of the court who decided whether a case should be brought before the king; *Markgrafen*, counts of the frontiers; *Holzgrafen*, counts of the forests, that is, inspectors, &c. These royal officers soon usurped power which did not belong to them, and treated the people so badly, that the emperors and kings were obliged to go themselves into the provinces, and hold courts, or to send particular officers for this purpose, called *Sendgrafen*. The sheriffs in England were originally the deputies of the English counts or earls, who correspond to the German *Grafen*. Their Latin title is still *vice-comes*. Their English title, derived from *shire* and *gerefa*, has the same origin with the German *Graf*. (See SHERIFF.) In the German Empire the power of the counts increased with the progress of the nation, whilst the imperial government became weaker and weaker. They even began to transmit their titles to their children, as did also the dukes, and other officers, in those times of unpunished usurpation. In the twelfth century the division of counties on the continent of Europe was abolished, and thus the counts lost their jurisdiction, except on their own possessions. In point of rank, the English earls are considered as corresponding to the continental counts. See EARL.

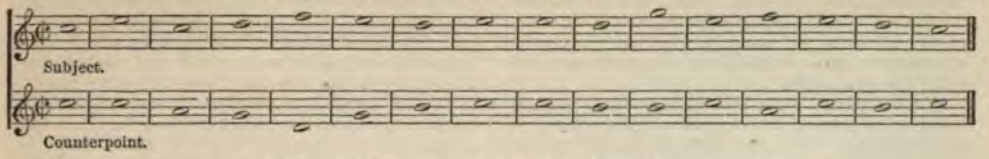
COUNT, in law, an independent part of a declaration or indictment, which, if it stood alone, would constitute a ground of action.

COUNT AND RECKONING, in Scotch law, is the name of a form of process by which one party may be called upon to render a complete statement of accounts, and show the amount due between him and another. The summons in the process concludes for an arbitrary sum, which may be claimed as the balance due if the defender fails to comply with its requirement.

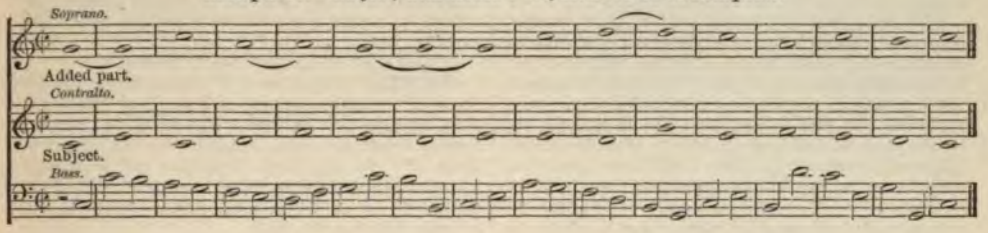
COUNTERMARK, in numismatics, the name given to those stamps or impressions which are found on ancient coins or medals, and have been given since their first impress. These countermarks or stamps are often executed without any care, and frequently obliterate the most interesting portion of the original inscription. There have been various opinions respecting the cause of these countermarks; some antiquaries thinking that they were to indicate an augmentation of the value of the money upon which they were stamped; others, that they were vouchers for workmen; and, again, that they were only struck upon money taken or received from foreign enemies. During the long war with revolutionary France, Britain stamped millions of Spanish dollars with small, oval countermarks of the head of George III., upon the neck of the Spanish monarch. Many of them were completely restamped or countermarked in the mint, but the new impression sometimes failed to entirely obliterate the old.

COUNTERPOINT, in music. This word is used in two different significations by musical authorities; by some it is employed simply as an equivalent of harmony, by others it is used to denote the art of composition generally. In former times musical sounds were represented by dots or points placed on the lines, and the added part or parts were written by placing the proper points under or against each other (*punctum contra punctum*). It is preferable to apply this term now to that branch of the art which, a musical thought being given, teaches the development of it, according to the laws of the art, by extension or embellishment, by transposition, repetition, or imitation throughout the different parts. It thus stands related to harmony as literary composition stands to grammar. *Simple* counterpoint is the art of adding a part or parts to a given melody in notes all of equal time value, as in plain song or ecclesiastical style. *Florid* counterpoint is when the notes of the added parts are of less time value (say two crochets or four quavers against a minim) than those in the melody or subject, as it is called. In *double* counterpoint, the subject may start in the bass and be repeated in the upper part, or *vice versâ*. It becomes triple or quadruple when two or three parts are added with the harmony inverted. Further, counterpoint is divided into the free and strict styles, the former, which is of the florid order, allowing many licenses as to discords, &c., not permitted in the dignified slow movement of the strict style. It has been said that the art was known as far back as the fourth or fifth century; others again ascribe its invention to Guido d'Arezzo in the eleventh century, or Adam de la Hale two centuries later. It was not until the seventeenth or eighteenth century that the art attained its maturity, under the fostering care of J. Sebastian and Emmanuel Bach, Handel, Haydn, Mozart, and Beethoven. The best authorities on this subject are the treatises of Albrechtsberger, Cherubini, and Fétis. We furnish some examples of the various styles, and would recommend an attentive study of the compositions of the great masters to those who are desirous of appreciating the results of the art.

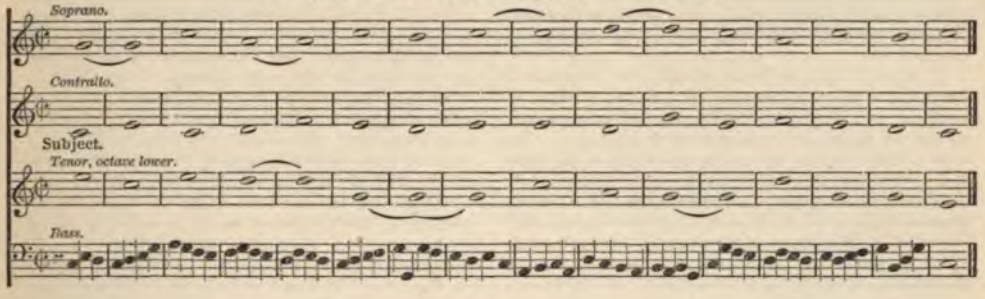
Example I.—Subject, with Simple Counterpoint.



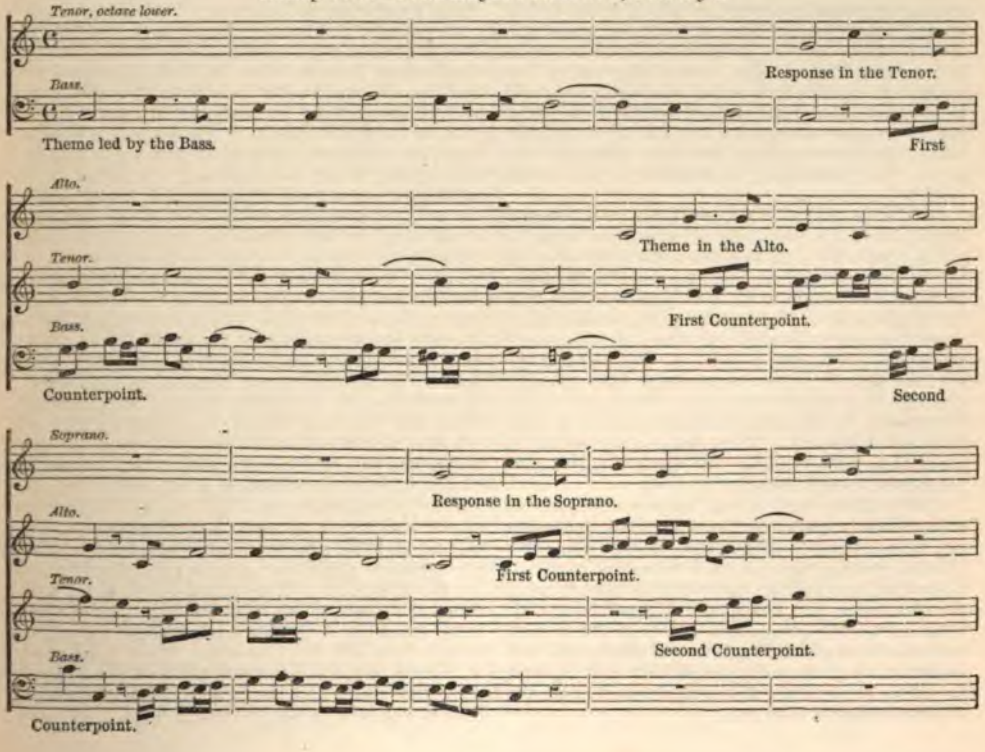
Example II.—Subject, with added Part, and Florid Counterpoint.



Example III.—Florid Counterpoint, in Four Parts.



Example IV.—From Haydn's Mass in C, Free Style.



COUNTERPROOF, in engraving, an impression taken from a newly-printed proof of a copperplate, for the purpose of a closer investigation of the state of the plate, as the proof is, in every respect, the reverse of the plate, while the counterproof has everything the same way.

COUNTERSCARP, in fortification, is properly the slope or *talus* of the exterior side of a ditch, towards the field. The inner slope, on the side towards the place, is called *escarpe*. Sometimes the covert way and glacis are termed *counterscarp*.

COUNTY was originally a district of country subject to a count or earl. It is now a civil division corresponding with *shire* in England and Scotland. In England each county is divided into hundreds. Each county is presided over by a lord-lieutenant, appointed by the crown, who has charge of the militia and all military matters. The chief civil officer of the crown in the county is the sheriff, to whom the custody of the county is committed by letters-patent. The larger counties are divided for purposes of parliamentary representation, and also for the more convenient administration of justice.

COUNTY CORPORATE, in England, is a title given to several cities or boroughs which have extraordinary privileges, so that they form counties by themselves.

COUNTY COURTS are an ancient institution in England. Their jurisdiction was formerly very restricted, but they have had extensive powers conferred on them by recent acts of Parliament. The new county courts, of which there are sixty, were established by act 9 and 10 Vict. cap. xcv. in 1846, and their jurisdiction has since been extended by numerous acts of Parliament. Their common-law jurisdiction in matters of contract, &c., extends to all cases in which the value of the subject in dispute does not exceed £50, or in hereditaments £20 annual value. The jurisdiction of the county courts is unlimited if the parties consent. A superior court may, on application of the defendant, order actions on contract where the amount indorsed on the writ does not exceed £50, to be tried in these courts. Actions for libel, slander, breach of promise, &c., cannot be begun in these courts, but may be removed to them by order of the superior courts, if the plaintiff cannot give security for the costs of the defendant. The county courts have also jurisdiction in equity (see CHANCERY), in insolvency, and in admiralty causes.

COUNTY PALATINE, in England, was a county distinguished by particular privileges; so called *a palatio* (from the palace) because the chief officer in the county had originally royal powers, or the same powers, in the administration of justice, as the king had in his palace. The counties palatine in England were Lancaster, Chester, and Durham. Lancaster was created a county palatine by Edward III. for his son John; the other two counties have held the privilege from time immemorial. There was a court of chancery in each of the counties palatine of Durham and Lancaster. There were many privileges attached to these counties. The rights of the counties palatine are now vested in the crown.

COUP (French, a *blow*). This term is used in various connections to convey the idea of promptness and force.—*Coup de main*, in military language, signifies a prompt, vigorous, and successful attack.—*Coup d'œil*, in a military sense, a rapid conception of the advantages and weaknesses of positions and arrangements of troops. It is also used for a quick comprehension of all the points and bearings of any subject.—*Coup de théâtre*, a sudden and striking change in the action.—*Coup d'état* is a forcible and arbitrary political measure.

COUPAR-ANGUS, a burgh of barony, Scotland, partly in county Perth, and partly in that of Forfar, 14 miles north-east of Perth, a station on the railway from Perth to Aberdeen. It contains many good houses, is well built, well paved, and well lighted with gas. It has a tannery, some extensive bleachfields, and carries on a considerable business in weaving some of the coarser kinds of linen fabrics. The vestiges of a Roman camp are still visible here. It was an equilateral quadrangle of 400 yards, and fortified by two strong ramparts and large ditches, comprised 24 acres, and guarded an important pass. Pop. in 1871, 2036.

COUP DE SOLEIL. See SUNSTROKE.

COURBEVOIE, a town of France, in the department of the Seine, on the left bank of the Seine, 5 miles north-west of Paris; pop. 9862. It has numerous handsome villas; extensive barracks, built by Louis XV. for the Swiss regiment; and a harbour, at which a considerable trade is carried on. It has manufactures of white-lead, printed cottons, and several other commodities.

COURCELLES, JEAN BAPTISTE JULIEN, CHEVALIER DE, a French genealogist, born 1759; died 1834. Most of the labours of De Courcelles are connected with family biographies and catalogues of the peerage of France. He was joint-editor of the third part of L'Art de verifier les Dates.

COURIER, a bearer of special despatches, whether public or private. The employment of couriers is of great antiquity. There was a very complete organization of them in the Empire of Persia. They were also used by the Greeks and Romans. Couriers who act as guides to and attendants on travellers are common on the Continent, and are useful to travellers having much baggage or unacquainted with the foreign languages and moneys. Information regarding them may be found in Murray's and other continental guides. There is a Couriers' Union, a United Couriers' Society, and other associations of couriers which have offices in London.

COURIER DE MÉRÉ, PAUL LOUIS, a celebrated French pamphleteer and enthusiastic classical scholar, was born at Paris in 1772. In 1791 he entered the artillery-school at Châlons, and in 1793 obtained the rank of lieutenant. He took part in various operations of the French army in the campaigns in Germany and Belgium, and in 1795 became captain. Throughout the whole of his military career, up to 1809, when he resigned his commission, he was rather noted for remissness and neglect in the performance of his duties, his attention being principally occupied with his beloved classics, and while with the army in Italy, in examining the literary treasures of the Vatican and other repositories. In the monastery of San-Lorenzo at Florence he was so fortunate as to discover the manuscript of the Daphnis and Chloe of Longus, which he afterwards translated and published. He also translated Xenophon's treatises on the employment of cavalry and on horsemanship. From the period of his quitting the army in 1809 till 1814 he led rather an erratic and unsettled life, but in the year last mentioned he united himself to Mdlle. Clavier, the daughter of an eminent Greek scholar, and intimate friend of his own. Subsequent to the restoration he made himself conspicuous as the advocate of constitutional government against the arbitrary principles sought to be re-established by the Bourbons. The pamphlets which he published in support of his views are admirable of their kind, sparkling and trenchant, though frequently acrimonious and even savage. They gave great annoyance to the government, which on one occasion made the author feel the weight of its resentment. The principal of these pamphlets were a Pétition

aux deux Chambres, published in 1816; a Simple Discours, written in 1821 in opposition to the project of purchasing Chambord for the Duke of Bordeaux, and for which Courier was subjected to two months' imprisonment and a fine of 200 francs; and the Pamphlet des Pamphlets, published in 1824. The following year he was cut off in a singular and unexpected manner. He had gone to his seat of Véretz in Touraine, and was there found in a wood one Sunday afternoon killed by a musket-shot. It was ascertained some years afterwards that the murderer was Fremont, Courier's gamekeeper, who had died, however, a short time before the discovery was made. The motive for the deed remained a mystery. A collection of Courier's writings, with a biographical sketch by Armand Carrel, was published in 1834.

COURLAND [Slavonic, *Kors;* German, *Kurland*], a government, Russia, bounded N. by Livonia and the Gulf of Riga, W. the Baltic, S. Kovno, and E. Vitebsk; area, about 11,000 square miles. In the neighbourhood of Mittau, the capital, the surface is diversified by hills of very moderate height; but elsewhere, and particularly towards the coast, it is flat, and contains extensive sandy tracts, often covered with heaths and morasses. About two-fifths of the whole government are occupied by wood; and there are no fewer than 300 lakes, mostly of small extent; but Usmeiten, the largest, has a circuit of 24 miles, is in many places 12 fathoms deep, and abounds with fish. The principal rivers are the Aa and the Windau; the latter is above 150 yards wide at its mouth, and is connected with the Niemen by a canal, commenced in 1825. Agriculture forms the chief occupation of the inhabitants, and is in a more advanced state than in some of the neighbouring governments. The horses, cattle, and sheep are generally of inferior breeds; but attempts have been made to improve the last by the introduction of the merino. The minerals are confined to a little iron, limestone, and amber. The manufactures are insignificant, with exception, perhaps, of tiles, which are made to a considerable extent. Distilleries also are numerous. About a half of the inhabitants are Letts. They chiefly occupy the rural districts, and up to 1820 were divided into peasants and slaves. At present they are free, but do not possess any property. The prevailing religion is Lutheran—the Greek Church, notwithstanding the proselytizing attempts of the Russians, barely counting 15,000 adherents. Courland was anciently a part of Livonia, and, like the latter, was conquered in the thirteenth century by the knights of the Teutonic order. It was subsequently united with Semigallia, and, under the name of the *Duchy of Courland*, the two provinces became a fief of Poland. The duchy, however, was governed by its hereditary dukes till 1737. The sixth duke, Frederick William, espoused in 1710 Anna Ivanowna, princess of Russia, who, after his death, maintained possession of the duchy; but the government of it was intrusted to Prince Ferdinand, brother of the deceased duke. On the death of Ferdinand, in 1737, the estates, in consequence of the influence of the Empress of Russia, elected her favourite and grand chamberlain, Ernest John Biren, to succeed him, who was exiled to Siberia in 1740. In 1762 the Emperor Peter of Russia recalled Biren, who, after some contention with Prince Charles, son of the King of Poland, who had been placed over the duchy in his absence, was declared by the estates the only legitimate duke. In 1769 he transferred the duchy to his son, at whose death the estates of Courland solicited a union with the Russian Empire. Catharine consented, and, by an edict of April, 1795, secured to the inhabitants all the privileges which they had enjoyed under their princes, and all the rights of her other subjects. In 1818 the Emperor Alexander confirmed the charter of the nobility of Courland, which declared the peasants free, and regulated their relations to their former lords. Pop. 597,288.

COURONNE DE TASSES, or Crown of Cups, a simple form of battery constructed by Volta. It consists of a number of zinc and copper cells arranged in series in a circle. Each cell is made up of a plate of copper and a plate of zinc placed in a cup or jar of dilute sulphuric acid. The copper of the first cell is connected with the zinc of the second, the copper of the second with the zinc of the third, and so on. When a wire is led from the copper of the last to the zinc of the first a current of electricity passes through the circuit. The cells were originally small and arranged in a circle, hence the name. The crown of cups has nothing more than historical interest, which it has from being the first liquid battery, as we have now much more powerful and constant batteries.

COURSER, or Courier (*Cursorius*), a genus of birds belonging to the plover family, of the order Grallatores (Waders), characterized by a bill as long as the head, arched mandibles compressed towards the extremities, basal oval nostrils, with an oblong lateral opening and long legs, with three separated front toes, the middle one longest, and armed with a serrated claw. They are found chiefly in Africa, on arid inland tracts, along which they run with great swiftness. One of the species, called the black-bellied courier (*C. temminckii*), is 8 inches long, and generally of a cream-coloured brown, varied by a ferruginous head and breast, and black on the quills and middle of the body. Another species, on which the genus was formed by Latham, and called the cream-coloured courser, or swift-foot (*C. Gallicus*, Lath.), has been seen as an occasional visitor both in France and England. Dr. Latham's specimen, presented to him by a gentleman who shot it near St. Alban's, in East Kent, was considered such a rarity that it was sold afterwards for eighty-three guineas.

COURT (*curtis, curia, aula*), the space inclosed by the walls of a feudal residence, in which the followers of a lord used to assemble in the middle ages to administer justice and decide respecting affairs of common interest, &c. It was next used for those who stood in immediate connection with the lord and master, the *pares curiæ*, the limited portion of the general assembly, to which was intrusted the pronouncing of judgments, &c. Finally it came to denote the residence of a prince with his family and highest officers. From this court (*aula principalis*), when the vassals began to take less part in the management of the public business, and this could no longer be transacted on the public court days (at Easter, Whitsuntide, and Christmas), the different permanent state authorities were separated with independent powers, and the actual court, the residents and daily attendants of the prince, acquired a distinct character. The etiquette of the courts has been formed in modern times, at first on the model of the old Spanish court, and subsequently the less formal ceremonial of the French court. The court offices are in part the old hereditary offices, derived from the times of feudal services. Besides these there are others of a more modern character, which are founded, however, in some degree at least, on the old distribution of services among such officers as the chief marshal, chamberlain, master of the horse, butler, &c. The modern court offices are now all personal, and have become very numerous.

COURT DE GÉBELIN, Antoine, born at Nismes in 1725; died at Paris in 1784. His father, a Protestant, left France on the revocation of the edict of Nantes, and repaired to Switzerland. The young Gébelin studied with eagerness the writings of the

ancients. In his twelfth year he gained the admiration of all by the extent of his knowledge. His studies embraced natural history, mathematics, the dead and living languages, mythology, antiquities and archæology. He settled in Paris in 1763 after the death of his father. Here he soon became connected with the most distinguished men. After ten years he published, from 1773 to 1784, Le Monde Primitif Analysé et Comparé avec le Monde Moderne, which, after nine volumes had appeared, remained unfinished. It is a work of disproportioned erudition, on a plan too vast for the labours of a single individual. The other works by which his name is known are Lettres Historiques et Apologétiques en Faveur de la Religion Réformée (Édinburgh, 1760), a work completed by him on materials left by his father; Histoire Naturelle de la Parole, extracted from his Monde Primitif (Paris, 1776). Towards the end of his life he became a believer in animal magnetism, which was at that time much in vogue. He defended Mesmer, the author of the theory, in his Lettre sur le Magnetisme Animal (Paris, 1784, 4to).

COURTESY, or CURTESY, TENURE BY, is where a man marries a woman seized of an estate of inheritance, and has by her issue born alive, and capable of inheriting her estate. In this case, on the death of his wife, he holds the lands for his life, as tenant by courtesy.

COURT-MARTIAL. See MARTIAL LAW.

COURTOIS, BERNARD, was born at Dijon, 1777, was trained in pharmacy, and having gone to Paris, entered Fourcroy's laboratory in the École Polytechnique. He had to join the army in 1799, and served in the military hospitals, but after his discharge he resumed his chemical work with Thénard and Séguin. In conjunction with the latter he discovered morphine in opium, but nothing was published on the subject till Séguin's paper long after, and Courtois' share has consequently been overlooked. In 1804 he began a nitrate of sodium work, the process consisting in decomposing nitrate of calcium by the carbonate of sodium obtained from kelp. In the course of his operations he observed that the iron vessels were corroded if the liquors from which the sodium salts had been crystallized were kept in them for a time. Investigating the cause of this, he found that on distilling the liquors with sulphuric acid a body with a splendid purple vapour was liberated. He examined it and ascertained some of its properties; for instance, its formation of a detonating compound with ammonia, and then gave a specimen of it to Clément, who read a paper on it, and ultimately resigned the investigation to Gay Lussac. This was the first discovery of iodine. In 1815 his nitre manufacture was ruined, and thereafter he had a precarious livelihood by making various chemical products. In 1831 the Academy gave him a prize of 6000 francs. He died at Paris, September 27, 1838, in poverty, and without any provision for his widow. Subscriptions for her were, however, obtained sufficient to enable her to live in comfort.

COURT-PLASTER, a very common plaster used for protecting the skin in cases of cuts or superficial injuries. It is made of thin silk covered with an adhesive solution as isinglass.

COURTRAI, or COURTRAY (Flemish, *Kortryk;* Latin, *Cortoriacum*), a fortified town and commune, Belgium, province of West Flanders, 26 miles south of Bruges, on the Lys. It is well built, having handsome and spacious streets, and a fine Grande Place, with several other squares. The principal edifices are, the town-hall, of Gothic architecture, with nothing remarkable in its exterior, but adorned within by two remarkable sculptured chimney-pieces; the church of St. Martin, founded about 650, with a majestic portico, from which ascends a graceful tower (one of the loftiest in Belgium), and adorned within by a fine Crucifixion by Vandyke; the church of St. Michael, a large and regular edifice, and containing the image of the Virgin, the object of great veneration and numerous pilgrimages; and the Broelen-Torren, two colossal towers, built for the defence of the town in 1413 and 1465, and with walls above 8 feet thick. Its manufactures are table-linens, flax and cotton wool, lace (which is celebrated), cambrics, flannels, &c. It is also the centre of extensive bleaching and dyeing works. In August a fair is held in the town for ten days. The first Flemish cloth manufacture was established here in 1260. The Lys gives Courtrai water communication with the principal towns of Flanders and the French department of Nord, while railways connect it with Ghent, Tournay, and the French frontier towards Lille. Courtrai is of early origin; in Roman times it was called *Cortoriacum.* The Normans took and fortified it in 880; the locality was made a countship in 988. The (first) 'battle of the Spurs' was fought close to the town, July 11, 1302, between the Flemings and French, in which the latter was defeated with immense loss, including the 8000 *gilt spurs* of the killed or vanquished French knights that gave name to the fight. In 1382 the French took and sacked the town, professedly to revenge this signal defeat. In 1385 Count Philip the Hardy erected new fortifications and strengthened the old, as did the French in 1647; the latter took the town again in 1793, after defeating the English in its neighbourhood. Courtrai, under their republic and empire, became chief town of an arrondissement of the department of the Lys. In 1814 it reverted to the Netherlands. Pop. 23,497.

COURTS OF LOVE (*cours d'amour, corti d'amore*). In the chivalric period of the middle ages, when love was not satisfied with remaining a cherished secret of the heart, but stood forth to public view; when enamoured knights were ambitious to draw the attention of the world, and prove the ardour of their passion by deeds of daring; when ladies were the soul and ornament of the tourney; and love, in short, was the serious business of life among the higher classes of society,—subtle questions on topics of gallantry were discussed in mixed companies, and often made subjects of poetical competition by the troubadours or poets in their *chansons;* such for example as the following:—'Which is most easy to be endured, the death or the inconstancy of a mistress?' 'Should you rather see me leave your mistress as you approach, or approach as you retire?' 'Who suffers most, a husband whose wife, or a lover whose mistress, is unfaithful?' At this period, when love was regarded as the source of nobleness of character; when even bishops sung its praises, and the uncultivated and unoccupied minds of a feudal nobility were at a loss for intellectual entertainment, the doubts and difficulties which grew out of the *belle passion* led to the institution of courts of love. The first was probably established in Provence about the twelfth century. These courts were composed of knights, poets, and ladies who gave their decisions as *arrêts d'amour,* after the manner of the parliaments. In 1803 Christopher von Aretin published a collection of these decisions from ancient manuscripts. There is likewise an older collection of them by Martial d'Auvergne. This species of amusement was so popular that hardly any court festival took place without a contest in a *cour d'amour.* These courts reached their highest splendour in France, under Charles VI., through the influence of his consort, Isabella of Bavaria, whose court was established in 1380. Under Louis XIV. an academy of love was instituted by Cardinal Richelieu (*assemblée galante*) at Ruel. It was an imitation of

the courts of love. The Princess Maria of Gonzaga presided, and Mademoiselle Scudery was attorney-general. We conclude with the interesting decision, somewhat at variance with the notions of our times, given by the Countess of Champagne on the question, 'Can true love exist between husband and wife?' The 'opinion' was: 'Nous disons et assurons, par la teneur des présentes, que l'amour ne peut étendre ses droits sur deux personnes mariées. En effet, les amants s'accordent tout mutuellement et gratuitement, sans être contraints par aucune nécessité, tandis que les époux sont tenus par devoir de subir réciproquement leurs volontés, et de ne se refuser rien les uns aux autres. Que ce jugement, que nous avons rendu avec une extrême prudence, et d'après l'avis d'un grand nombre d'autres dames, soit pour vous d'une autorité constante et irréfragable. Ainsi jugé, l'an 1174, le troisième jour des calendes de Mai, indiction septième.' That is: 'We certify, by the tenor of these presents, that love cannot extend its rights over two married persons. In fact, lovers agree mutually and gratuitously, without being constrained by any necessity, whilst married persons are bound by duty reciprocally to yield their wills, and refuse nothing to each other. Let this judgment, which we have given with extreme deliberation, and in accordance with the opinion of a great number of other ladies, be your constant and indisputable authority. Thus decided in the year 1174, third day of the calends of May, seventh indiction.'

COUSIN, Victor, French philosopher and writer, was born at Paris 28th Nov. 1792. He was educated at the Lycée Charlemagne, and entered the École Normale, then newly instituted, in 1811. In 1812 he became a Greek tutor, and in 1814 *maître de conférences de philosophie* in the same institution. Among his masters at this period were Laromiguière and Royer-Collard. The latter introduced him to Maine de Biran, and the friendship of these scholars had no small influence in determining his philosophical career. In 1815 Royer-Collard, returning to political life, recommended Victor Cousin as his successor, and he became deputy-professor of philosophy at the Sorbonne, while still continuing to hold his appointment at the École Normale. He had also an appointment at the Lycée Napoleon, or Collége Henri IV. He had at the Sorbonne the high distinction of numbering among his friends and pupils former fellow-students like Jouffroy and Damiron, destined to future eminence as teachers of philosophy. Laromiguière had taught with great eloquence the prevailing philosophy of the period, derived chiefly from the sensational school of Condillac. Royer-Collard, from an accidental acquaintance with a work of Reid's, which he is said to have picked up on the *quais*, became a disciple and exponent of the Scotch school. Cousin followed him. In the free discussions (conférences) which followed his lessons at the École Normale, as well as in his prelections at the Sorbonne, he became by the influence his eloquence exercised over his pupils the founder of a school which, while assuming an eclectical development, was originally based on the dogmatic teaching of the Scotch school. His early associations also made Cousin an enthusiastic patriot and an ardent royalist. During the hundred days he enrolled himself among the royal volunteers. In 1817 he visited Germany, and became acquainted with the writings of Kant, Fichte, Jacobi, and Schelling, by whose opinions his own were henceforth modified. He devoted two sessions (1819–20) to a History of Moral Philosophy in Europe in the Eighteenth Century. Taking first the sensational school of Locke and Condillac, he proceeded from it to the Scotch philosophy, and then to the philosophy of Kant. At the end of the second session he yielded to the request of his pupils to give an outline of his own philosophical views, which is reproduced at the end of his volume on Kant. His studies while thus actively engaged in teaching embraced the widest range of philosophical inquiry, both in ancient and modern times. Besides the German philosophers, Plato and Descartes may be mentioned as having powerfully influenced the development of his views. Having in his lectures given expression to doctrines that were thought antagonistic to the retrogressive politics of the day, he was suspended from the performance of his duties at the Sorbonne; and thus, on the dissolution of the normal school in 1822, he lost the position of public instructor altogether. During this period of retirement the philosophical zeal of M. Cousin found ample occupation. He undertook the publication of the works of Proclus, a complete edition of Descartes, and a translation of Plato, finished in 1840, and highly esteemed for its beauty. He also accepted the post of private tutor to the son of Marshal Lannes, and in this capacity visited Germany in 1824. At the instance of the Prussian government he was arrested in Dresden as a wandering carbonaro, taken to Berlin and detained for six months. He took advantage of this compulsory residence in the Prussian capital to study the philosophy of Hegel. On his return to France he threw himself heart and soul into the opposition, and when the ministry of Villèle was succeeded by the more liberal one of Martignac, he was reinstated in his old chair at the Sorbonne. His lectures, along with those of Guizot and Villemain, now acquired a popularity partly due to political causes. A lover of liberty, though a supporter of constitutional government, he had suffered from the misapprehension of his principles, and was now the object of an enthusiasm caused by another misapprehension which gave every allusion of an eloquent speaker to the rights and dignities of human nature a present political significance. After the revolution of 1830 he received brilliant honours from the new government, being in the course of a short time appointed councillor of state, member of the council of public instruction, officer of the Legion of Honour, member of the French Academy and of the newly-established Academy of Moral and Political Sciences, director of the École Normale, and peer of France, 1832. In 1830 he retired from his professorship, being succeeded as deputy-professor by Jouffray. In 1831 he received a commission from the board of public instruction to visit Germany for the purpose of becoming acquainted with the educational systems adopted there, especially that of Prussia, and to make a collection of authentic documents bearing thereon. The results of this journey appeared in his work, De l'Instruction Publique dans quelques Pays d'Allemagne et particulièrement en Prusse (2d ed. two volumes, Paris, 1840). In the cabinet of Thiers in 1840 he accepted the office of minister of public instruction. The revolution of 1848, to which he was favourable, and which he assisted by his pen, brought his public career to a close, and henceforth he devoted himself entirely to literature. He died at Cannes, 14th Jan. 1867. He left his library to the Sorbonne in the following pithy clause of his will:—'I bequeath to the Sorbonne my best work, my library.'

As a lecturer and philosophical writer, Victor Cousin was distinguished by a rare combination of eloquence, enthusiasm, and clearness of exposition. He possessed, it has been said, a beauty of style such as no modern or ancient philosopher excepting Plato has equalled. His labours as an illustrator of the history of philosophy were immense, embracing besides numerous works of interpretation critical studies of writers so diverse as Plato, Abélard, Descartes, Pascal, and

Proclus. In his exposition to his scholars of the various systems of philosophy reviewed in the course of his instruction, he distinguished himself equally by the fidelity of his exposition and the logical force of his criticism. The head and founder of the modern school of eclecticism in France, he borrowed from many sources, and has been accused without much force of want of originality; but he acknowledged himself especially indebted to two great thinkers, to Descartes for his psychological method, and to Leibnitz for the eclectical. In combining these two methods, or rather in subordinating the latter to the former, lay the grand speciality of Cousin's teaching. His eclecticism by no means partook of the impartiality of indifference. It was based on the principle that every system, however erroneous, which has anywhere commanded assent, contains some elements of truth, by which its acceptance may be explained, and that it is the business of philosophical criticism to discover and combine these scattered elements of truth. 'Ma route,' he said, 'est historique, il est vrai, mais mon but est dogmatique; je tende à une theorie, et cette theorie je la demande à l'histoire.' He was a dogmatist in opposition to scepticism; a spiritualist in opposition to materialism, or, as he called it, sensualism; and a realist in opposition to idealism. Moreover, notwithstanding accusations to the contrary, Cousin was consistent in his views from the beginning to the end of his course. It would be too much to expect that an eclectic philosopher should never modify his views, or that any philosopher should always be consistent in his expressions, but the progress of Cousin, fairly judged, must be regarded as a legitimate development, and probably few copious writers have displayed fewer inconsistencies. The results of his philosophy will, of course, be differently estimated according to the school to which the critic may belong, and it is perhaps a not very encouraging comment on philosophical criticism that a writer who spent his life in combating various forms of scepticism, pantheism included, should have been accused of tendencies to pantheism and scepticism. The remarkable sympathy with which he enters into the views of the writer or school he is expounding, a characteristic of the school he founded, may have occasioned some equivocal passages, but the consistency of his career is manifest in the complacency with which at its close he reviews his early works. It is the same thinker who, in his prefaces of 1857, re-affirms his sympathy with the Scotch school, and his antagonism to the 'idealism' of Kant, as in 1819 and 1820 expounded their doctrines at the École Normale and the Sorbonne. Perhaps of his philosophy, as of many others, it may be said that its least satisfactory phase is its positive or dogmatic aspect. In dealing with the transcendental elements of philosophy he is apt to content himself with phrases of which the logical form conceals the destitution of meaning, as when he insists that the knowledge of a substance is contained in the knowledge of its attributes, a proposition which, when asserted as implying a positive knowledge of substance, makes knowledge pretty nearly synonymous with ignorance.

The following are among the most important of Cousin's works:—Procli Philosophi Platonici Opera (8vo, six volumes, Paris, 1820–27); Platon, Traduction de (thirteen volumes, 1825–40); Descartes, Œuvres Complètes (eleven volumes, 1826); Fragments Philosophiques (one volume, 1826); Nouveaux Fragments Philosophiques (one volume, 1828); Maine de Biran, Œuvres de (four volumes, 1834–41); Abailard (Sic et Non) (one volume, 1836); Abælardi Opera (two volumes, 1849); Cours de Philosophie Morale Professé à la Faculté des Lettres de 1816 à 1820 (five volumes, 1840–41); Cours de l'Histoire de la Philosophie comprenant l'Introduction à l'Histoire (one volume, 1828); Histoire de la Philosophie au dix-huitieme Siècle (two volumes, 1829); De la Métaphysique d'Aristote (one volume, 1838); Philosophie Scolastique (one volume, 1840); Des Pensées de Pascal (one volume, 1842); Jacqueline Pascal (one volume, 1845); Fragments de la Philosophie Cartésienne (1845); La Jeunesse de Madame de Longueville (1853); Du Vrai, du Beau et du Bien (1854); &c. Many of these have been republished, the Philosophie Écossaise and the Philosophie de Kant are published separately, each in one volume 8vo. The first complete edition of his works, in twenty-two volumes 18mo, was published in 1846–47.

COUSTOU, Nicholas, born at Lyons, January 9, 1658; died at Paris in 1733; and GUILLAUME COUSTOU, born in 1678; died at Paris in 1746; two brothers, famous as sculptors in France during the reign of Louis XV. The elder is admired for his ability in grouping and delicacy in design, although a tendency to an affected refinement which was then becoming common, is observable in his works. His Descent from the Cross, in the Cathedral in Paris, is particularly valued. The younger brother was a worthy disciple of the elder, whom he succeeded as director of the Academy of Fine Arts. Among his works the monument of the Cardinal Dubois, in the church of St. Roch, is much esteemed. But he was surpassed by his eldest son, also named Guillaume (born at Paris in 1716, where he died in 1777), on whom Joseph II., during his stay in Paris, conferred with his own hands the order of St. Michael. The statues of Venus and Mars, larger than life, which he made in 1769 for the King of Prussia, gained universal admiration. His monument of the dauphin and dauphiness, parents of Louis XVI., in the cathedral of Sens, bears the character of majestic simplicity.

COUTANCES (ancient *Constantia*), a town, France, department Manche, 16 miles w.s.w. of St. Lo; pop. 8159. It occupies a hill of syenitic granite, about 4 miles from the sea, with which it communicates by a canal, and is so ancient that it was a bishop's see in 430. It was early fortified, and became the capital of the district of Cotentin, but its fortifications have almost entirely disappeared. It is not well built, though great improvements have recently been made. The cathedral, crowning the hill on which the town stands, is one of the finest churches in Normandy, and its two lofty towers, terminating in spires, are so conspicuous as to form a landmark for vessels in the channel. It was consecrated in 1056, and rebuilt at the beginning of the thirteenth century. The manufactures are parchment, thread, muslins, druggets, quilts, &c.; the neighbourhood produces marbles; and there is a considerable trade in these, and in agricultural produce.

COUTHON, Georges, a noted French revolutionist, was born in 1756 at Orcet, in the district of Clermont, and was bred to the profession of a lawyer. Immediately previous to the revolution he had made himself conspicuous as a liberal in the provincial assembly of Auvergne, and had also gained considerable popularity by the gratuitous assistance which he afforded the poor and to charitable institutions. Some time after the revolution he was chosen a member of the national assembly, where he soon forfeited the character for mildness and amiability which he had formerly possessed, and allying himself with Robespierre, aided and abetted the latter in all his atrocities. On the downfall of Robespierre's party Couthon shared, along with him and St. Just, in the decree of arrest pronounced by the Convention on 9th Thermidor. The same day he and his compeers

were seized in the hotel de ville, where, in the scuffle that ensued, Couthon was nearly trampled to death, but survived sufficiently to be guillotined next day (28th July, 1794).

COUTTS, THOMAS, a London banker, eminent for his wealth and his connections. He was a native of Scotland, born at Dundee in 1731, and early in life went to London, was admitted a partner in a mercantile house in St. Mary's Axe, and afterwards became partner with his brother in a banking establishment in the Strand, where, by a long life of successful business, he amassed an immense fortune. He died in 1822. He was twice married; first to Susan Starkie, a female servant of his brother James, by whom he had three daughters—Susan, married in 1796 to George Augustus, third earl of Guildford; Frances, married in 1800 to John, first marquis of Bute; and Sophia, married in 1793 to Sir Francis Burdett, Bart. In 1815 his first wife died; and three months afterwards he married Harriet Mellon, an actress at the head of the second class of actresses at Drury Lane. Mr. Coutts at his death left her all his property. Mrs. Coutts subsequently married the Duke of St. Alban's, a young man of an income rather limited for his rank. The duchess at her death left the bulk of her property to Miss Burdett Coutts. Her charities were very extensive.

COVENANT, in law, an agreement between two or more parties in writing signed, sealed, and delivered. He who promises is called the covenanter; he to whom the promise is made, the covenantee. If the covenanter covenants for himself and his heirs, it is called a *real* covenant, that is, affecting real in contradistinction to personal estate. See BOND and CONTRACT.

COVENANT, the first bond or oath drawn up by the Scottish reformers, and called by them a Covenant, was signed in the winter of 1557, on the second coming of Knox to Scotland; another signed by King James, and called the King's Covenant, was signed in 1580. These documents, which it is difficult to characterize by an abstract, are given at length in Burton's History of Scotland. After the union of the crowns of Scotland and England (1603), as the Stuarts favoured the Episcopal churches, whose hierarchical form seemed fitted to promote their despotic views, the dangers which threatened Presbyterianism brought its followers in Scotland to a closer union; and when, in 1637, the new liturgy, modelled after the English, was ordered to be introduced into their churches, disturbances arose, which ended in the forming of a new covenant the following year. This was called the National Covenant. The subscription of it began in the Grayfriars' Church, Edinburgh, on the 28th of February, 1638. Copies were circulated throughout the country for general signature, many of which are still extant. The Covenant, with the confession of faith which it embodied, was ratified by the General Assembly at Glasgow, November 21, 1638, and by the Scottish Parliament in 1640. It was signed, along with the Solemn League and Covenant, by Charles II. on his landing in Scotland in 1650, and again at his coronation at Scone, on 1st January, 1651. The Solemn League and Covenant was an agreement entered into by the English Parliament with the Scottish nation during the civil war in the reign of Charles I. In 1642 the Parliament had applied to the Scots for aid, and the application was pressed more earnestly in the following year. The Covenanters, who were then masters of Scotland, demanded that the English Parliament should take the Covenant, and assimilate the doctrine and discipline of the churches of the two nations. In consequence of this stipulation, on the 25th of Sept, 1643, both houses of Parliament met at St. Margaret's Church, Westminster, along with the Assembly of Divines and the Scottish commissioners, to take the Covenant, which had been modified by the Assembly. After prayers and sermons, all present held up their hands in testimony of assent to it; and afterwards, in their several houses, subscribed it on a Parliament roll. The House of Commons ordered it to be taken by all persons in their respective parishes next Lord's-day. It was subscribed by Charles II. in 1650, and at his coronation at Scone on 1st January, 1651. In 1661 it was burned by the hangman, and in 1662 abjured by act of Parliament, both in England and Scotland.

COVENANTERS. When Laud's liturgy was introduced into Scotland in 1637 without consent of Parliament, or of the General Assembly, it excited the strongest opposition among all classes, both on political and religious grounds. The manner of its introduction and enforcement, including every aggravation of insulting despotism, roused into common action all who cared for the civil as well as all who valued the religious liberties of the country. Some riots took place in Edinburgh on the introduction of the new liturgy, which gave only a faint indication of the universal excitement of feeling which the event stirred up throughout the country. Notwithstanding the strength of this feeling, however, the remonstrances of the people at first took the most constitutional form, and were accompanied with every mark of respect for the royal authority. The remonstrants, contenting themselves with the humble name of supplicants, poured in petitions from every quarter, in which all ranks joined, and which were rendered more numerous and influential by a regular organization formed throughout the kingdom for promoting them. The anxiety of the supplicants, however, was too great to exhaust itself in petitioning. Men of rank and means, as was natural in a time of public perplexity, crowded to the capital; thither too deputations from public bodies and the lower classes of citizens, who could not personally appear there, were despatched, to represent the general feeling of the nation. All these strangers, whose sole business in Edinburgh was bound up in the common subject of concern, besieged the council with applications directed to the accomplishment of their petitions. In the meantime, as a consequence of the early riots, the council, by direct orders from the king, issued a proclamation commanding all strangers to leave Edinburgh. The order was wholly disregarded, and only served to excite still more the indignation and zeal of the supplicants. To relieve themselves from immediate pressure, the council now took a step which had the most disastrous consequences for the royal cause. They yielded to, if they did not suggest, a plan by which the supplicants were organized into regular constituences, and represented by authorized deputies in the capital. A sort of double representation was contrived. The four orders of nobles, lesser barons, burgesses, and clergy, each selected their principal members as an elective body, and these again chose four for each order, who formed a permanent committee of sixteen, who were to remain in Edinburgh, being relieved from time to time by new representatives, until the object of the organization was accomplished. The name by which this combined committee became known was *the Tables*. This organization being completed, the crowd of strangers left Edinburgh.

When their remonstrances proved unavailing with the council, the new representative body took a step in advance, and in the name of their constituents followed their supplications with a protestation carefully drawn by their ablest lawyers. This protesta-

tion was the reply to a proclamation in which the king took upon himself the responsibility of the changes introduced, and commanded obedience to his orders about the Service-book. At Stirling, Edinburgh, Linlithgow, and wherever the proclamation was read, the popular party assembled, met it with jeering and laughter, and compelled the authorities to stay until the protestation had also been read.

The next great step taken by the protesters, at the suggestion, as is generally understood, of Archibald Johnston of Warriston, their leading ecclesiastical lawyer, and which subsequently gave the name to the party by which it has since been known in history, was the renewal of the Covenant (see COVENANT), with additions professing their loyalty, and swearing to stand to the utmost of their power in defence of 'the king's majesty, his person and authority, in the defence and preservation of the foresaid true religion, liberties, and laws of the kingdom, as also to the mutual defence and assistance every one of us of another,' in maintaining all that had been previously sworn to. The new Covenant was publicly and generally signed, as mentioned in the article above referred to. Such was the zeal of the subscribers, that some of them, as is reported, signed it with their own blood. The Covenanters now became a thoroughly organized body, watching with jealousy the proceedings of the government, and openly resisting any act suspected of hostility to their views. It is sometimes said by historians that the demands of the party increased as the royal necessities compelled concessions to be made to them; but Burton, from whom this narrative is chiefly drawn, says they were complete before any concession was made, and were announced with a distinct candour which showed consciousness of power. The main points of these demands were the abolition of the court of high-commission; the withdrawal and disavowal of the Book of Canons, the Book of Ordination, and the Service-book; a free Parliament, and a free General Assembly.

The Marquis of Hamilton, who had been appointed lord high-commissioner and representative of the king, found himself in great difficulties from the division of the council itself, part of which, including the king's advocate, favoured the Covenanters. The Covenanters also were acquainted with his instructions, which were to gain time and temporize till the arrival of a royal fleet in Scotland should enable him to crush them. These instructions were suddenly superseded by others issued on 10th September, 1638, completely yielding the demands of the Covenanters, and commanding the privy-council themselves to sign the Confession of Faith, and bond thereto annexed (the King's Covenant) 'signed by our dear father, and enjoined by his authority.'

A General Assembly was held in the cathedral of Glasgow in 1638. The lord high-commissioner objected to its constitution, and withdrew before the formal business was concluded. The Assembly notwithstanding continued its sittings, and was countenanced by many of the nobility, conspicuous among whom were the Earl of Argyle and the Marquis of Montrose. The Assembly repealed the acts of previous assemblies, from 1606 downwards, particularly the Five Articles of Perth, and repudiated the Service-book, the Book of Canons, and the Book of Ordination. Of the fourteen prelates six were deposed and eight deposed and excommunicated, and the church courts were reconstructed on a presbyterian basis. The Earl of Montrose, accompanied by a committee of clergymen, was now sent north to subdue the prelatical city of Aberdeen to the Covenant. As argument did not succeed, Aberdeen was taken possession of by a Covenanting army. Negotiations were opened with Huntly, the head of the Cavalier party, who was invited to Aberdeen, and treacherously sent a prisoner to Edinburgh. He was succeeded by his second son Lord Aboyne, but Montrose, who was sent north again by the Tables in 1639, met with little resistance from the royalists. The Tables, which were now installed as a regular government, now easily got possession of most of the royal fortresses throughout the kingdom. The king in the meantime had been preparing for war. The feudal force of England had been summoned to assemble at York, and on the 1st of May, 1639, while the events already recorded were in process, Hamilton entered the Firth of Forth with nineteen vessels. These vessels seemed to have contained only a sham army intended to frighten the rebels, but instead of producing this effect, they imparted greater energy to the measures of the Covenanters. The Tables had already an army of 20,000 men embodied, and an ample provision of arms. They were engaged in drilling, and now fortified Leith, and took measures for the defence of the coast. On the 21st May the Covenanting army under General Leslie began its march to the English border. It consisted of 22,000 foot and 500 horse. It was met by a proclamation from the king, that if the Scots came within 10 miles of the English border they would be treated as rebels, and attacked by the English army. The Scottish army encamped at Dunse Law, about 13½ miles from Berwick, but only about 8 from the border, where the remains of their encampments are still to be seen. The English army were on the other side of the Tweed. It was much inferior in composition to the Scotch, and the king's advisers considered it necessary to treat. The conclusion arrived at was in effect that both armies should be disbanded, the fortresses restored to the king, and the matters in dispute referred to a free Parliament and Assembly.

The Assembly met at Edinburgh in August 1638, and, without referring in its acts to the Assembly of Glasgow, confirmed all it had done. The estates in 1640 confirmed the proceedings of the Assembly, and adopted the Covenant as an act of their own, requiring all citizens, under civil penalties, to subscribe to it. Before accomplishing this work the estates had met in 1639, and been adjourned by royal mandate. Their subsequent sitting was not sanctioned by the king, although the adjournment was to a fixed date, and while they maintained their constitutional right to act as they had done, they were now in direct opposition to the royal authority. They showed their sense of the critical position in which they were placed by appointing a committee of estates to act when Parliament was not sitting, and this committee was authorized to act in the camp as well as at the seat of government. The resistance of the Long Parliament to the arbitrary authority of the king was thus preceded and anticipated by these decisive steps of the Scottish estates, which had been rendered necessary by what had taken place in England.

An intercepted letter had revealed to the English court that some of the leaders of the Covenanters were negotiating with Richelieu for aid from France. This was deemed of sufficient importance to compel the calling of an English Parliament. The object was to obtain supplies for conducting a war, but the Parliament was dismissed without granting anything. The king determined to maintain his own views of his prerogative, had recourse to ship-money and other means of extortion to raise the necessary supplies for a war. The Covenanters on their part reassembled their army, which, consisting of their most zealous supporters, was easily recalled.

On the 20th of August, 1640, they crossed the Tweed at Coldstream under Leslie. It fell by lot to Montrose's contingent to lead the march. On the

same day Charles left London for York. On reaching Newcastle the Scots found an English force under Conway prepared to resist their passage of the Tyne. A battle took place at the village of Newburn, in which, after a slight resistance, the Scots were victorious, and occupied Newcastle, on which they were obliged to levy contributions to sustain their army. Durham, Tynemouth, and Shields yielded without a struggle. After these successes the Covenanters addressed another of their quaint supplications to the king, in which they mentioned that they had been compelled 'to put out of the way' such forces as had opposed their peaceable progress throughout the kingdom. The demands of the Covenanters now extended to the calling of an English Parliament, and the protection from 'new oaths' of their fellow-subjects in England and Ireland. A council of peers summoned by Charles at York recommended negotiations, and the demands of the Scots were referred to a commission appointed to meet at Ripon on 1st October, to which they were to send eight commissioners. The negotiations at Ripon ended in the issuing of writs for the Long Parliament, the payment of the expenses of the Scots army, and the adjournment of the negotiations to London, whither the Scots commissioners proceeded. The treaty was concluded in 1641, on the terms that the king was to admit the acts of the Parliament of 1640, the Scots army was to receive £300,000 from England, its brotherly assistance, and the incendiaries or causers of the war, in both countries, were to be punished.

In the Scottish Parliament of 1641, attended by the king in person, everything was done to complete the triumph of the Covenanters, and all public offices were now in their own hands. But amid this flood of prosperity new dangers began to be descried. The fidelity of Montrose and others of their leaders had long been suspected, and Parliament was now engaged in a long investigation of a circumstance called the Incident, which was a suspected plot to murder Hamilton, Argyle, and Lanark, but in which nothing was brought out clearly except the disaffection of Montrose. A still greater triumph, however, awaited the Covenanters, when, in 1643, the Solemn League and Covenant was taken and enjoined by the English Parliament. This step was taken to secure the assistance of the Scots in the civil war, which was then going against the Parliament. To meet this exigency the estates of Scotland assembled on 22d June, 1643, reappointed their committee, and an army of 21,000 under Leslie, now earl of Leven, with his nephew, David Leslie, as major-general, again approached the border. This army crossed the Tweed on 19th January, 1644, and proceeded to besiege Newcastle. The town was taken by storm on 20th February, and the castle surrendered on the 27th. This capture was of great importance to the Parliament, as London depended on Newcastle for its supply of coal. While the siege was progressing, the main army of the Scots joined the parliamentary army under the Duke of Manchester, accompanied by Fairfax and Cromwell. The united armies proceeded to drive the royalists from York, which was covered by a royalist army under Prince Rupert, who gave battle at Long Marston Moor, 5 miles west of the town. The result, as is well known, was a complete victory. The credit of this victory has been claimed by the English for Cromwell, by the Scots for David Leslie. The latter held the higher command, but his fame has been eclipsed by the subsequent renown of the former. The battle was fought on 2d July, 1644. In the meantime Montrose, who had gone over to the royalists, attempted, with the assistance of an Irish and Highland army, to recall the Scottish army from England by a diversion in the north. In two campaigns in 1644–5 he gained some brilliant victories which excited the hopes of the royalists to the highest. He was named Viceroy of Scotland, and moved to the borders to recruit his army, and co-operate with the English royalists. The Scots army was before Hereford when pressing demands for assistance reached them from the committee of estates. They despatched a body of cavalry under David Leslie. Montrose was completely defeated by this leader at Philiphaugh, and compelled to leave the kingdom. The affairs of the king had likewise become hopeless in England, and on 6th May, 1645, he appeared within the lines of the Scots army posted before Newark, and surrendered himself their prisoner. The king remained at Newcastle with the Scots army till the 30th of January, 1647. They tried in vain to reconcile him to Presbyterianism, and failing in this, surrendered him to the English on payment of their arrears of pay, and returned home. The Scots, in fact, could not take the king with them unless he had agreed to their designs, and, as Burton observes, they had no more reason then to suspect the English than themselves of intending to put him to death. While at Newport, in the Isle of Wight, the king entered secretly into an engagement to do what he had refused to do when with the Scottish army at Newcastle. A majority of the estates accepted this engagement, though many of the most influential Covenanters were opposed to it, and sent an army into England under the Duke of Hamilton to restore the king. It was surprised by Cromwell at Preston, 17th August, 1648, and easily defeated. Cromwell marched to Edinburgh, where the opponents of the engagement, who were in alliance with him, had already gained the preponderance, and a civil war in Scotland was thus prevented. Here he took the Covenant, and stipulated for the exclusion from office of all persons accessory to the engagement. A Parliament met in January, 1649, confirmed this exclusion, together with that of all malignants and enemies of the Covenant.

On the 30th of January, 1649, Charles I. was beheaded. The news of his execution reached Edinburgh on 5th February, and Charles II. was immediately proclaimed King of Great Britain, France, and Ireland. In the beginning of 1650 the Scots sent commissioners to treat with Charles in Holland, and as Montrose, who had espoused his cause, had been taken and executed, he put himself in their hands, arrived in Scotland in July, and took the Covenant. To arrest the royalist movement, Cromwell crossed the Tweed on 16th July. The battle of Dunbar was fought between him and Leslie on 3d September, 1650. The watchword on the side of the Scots was 'The Covenant;' on that of the English, 'The Lord of Hosts.' Cromwell gained a complete victory. This defeat threw the south of Scotland open to Cromwell, but the north was still in the possession of the Covenanters. Calamity, however, began to develop the bad qualities of a theologico-political party. When union could hardly have saved them from their enemies, they were divided among themselves into two parties called Resolutioners and Protesters, preachers acquired more and more the ascendency among them, and endless inquiries into the 'causes of wrath' took the place of civil and military organization. From this time the history of the Covenanters as a great political party, influencing by its action the destinies of Great Britain, is at an end. Henceforth it is the history of a religious sect, chiefly interesting through its sufferings and the tenacity of its adherence to its principles. This sect, though it has gradually declined, and undergone various modifications and changes of name, still exists under the name of REFORMED PRESBYTERIANS (which see).

Charles II. was crowned at Scone on the 1st of January, 1651, when he again took the Covenant. A new army was raised. It was placed under the command of David Leslie, gave Cromwell the slip, marched into England and reached Worcester before he overtook it. A battle ensued, in which the Scots were defeated. Charles escaped with a few followers. So ended his connection with the Covenanters, their position as a political party, and the civil war which they had begun. The battle was fought on 3d September, 1651.

COVENT GARDEN, a market-place in London, which formerly consisted of the garden attached to a convent or religious house. The first theatre erected here was built in 1733. This was burned to the ground in 1808, but immediately rebuilt from a design by Smirke at a cost of £300,000. It was again burned in 1856, and again wholly rebuilt.

COVENTRY, a city in England, of great antiquity, the final syllable being evidently the British *tre*, signifying *town*. It is situated in the county of Warwick, 85 miles north-west of London. It was formerly surrounded with lofty walls, and had twelve gates. Parliaments were convened here by the ancient monarchs of England, several of whom occasionally resided in the place. In the civil war of the seventeenth century Coventry was conspicuous for its activity in the parliamentary interest. Pageants and processions were celebrated here in old times with great magnificence, and a remnant of these still exists in the processional show in honour of Lady Godiva (see GODIVA—LADY), which used to be graced by the presence of the mayor and corporation in their official robes. There are still a few narrow and irregular streets in the town, lined with houses in the style of the fifteenth and sixteenth centuries, composed of heavy wooden beams filled in with brick and plaster, and often having their peaked upper stories projecting far into the street over the under ones. Many of the edifices are highly worthy of attention. St. Michael's Church is a beautiful specimen of the pointed style of architecture. St. Mary's Hall, erected in the time of Henry VI., is esteemed one of the finest specimens in England of the ornamental architecture of the fifteenth century. The cathedral was destroyed at the Reformation. The principal manufactures are weaving, watchmaking, and ribbon manufacturing. For the last it is the greatest emporium in England. Coventry sends two members to the House of Commons, and has done so since 1453. Pop. in 1871, 41,348.

COVE OF CORK. See QUEENSTOWN.

COVERDALE, MILES, the earliest translator of the Bible into English, was born in Yorkshire in 1487. He was educated at Cambridge, in the house of the Augustine friars, and was ordained a priest at Norwich in 1514. He was led some years afterwards to embrace the reformed doctrines, and, having gone abroad, assisted Tindall in his translation of the Bible. In 1535 his own translation of the Scriptures appeared, with a dedication to Henry VIII. The Psalms in it are those now used in the Book of Common Prayer. In 1538 he was engaged in superintending at Paris the printing of a new English version of the Bible, the greater part of the impression of which was seized and destroyed by the ecclesiastical authorities. The printing-presses and types, however, escaped the fangs of the inquisitors, and being brought over to England, enabled Cranmer's, or the Great Bible, to be printed in the following year. Coverdale was almoner to Queen Catharine Parr, Henry VIII.'s last wife, and officiated at her funeral. In 1551, during the reign of Edward VI., he was appointed Bishop of Exeter, but was ejected on the accession of Mary, and thrown into prison. After two years' confinement he was liberated, and proceeded first to Denmark, and subsequently to Geneva, where he was employed with other English exiles in preparing the Geneva translation of the Scriptures. On the accession of Elizabeth he returned to England, but the views on ecclesiastical ceremonies which he had imbibed while abroad prevented his being restored to his see of Exeter. He was, however, made rector of St. Magnus, London Bridge. He died in 1568. The third centenary of the publication of his Bible was celebrated by the clergy throughout the churches of England, 4th Oct. 1835.

COVERED WAY (*chemin couvert*), a space of ground on the edge of the ditch, ranging round the works of a fortification. Its glacis descends by an easy slope towards the field. It affords a safe communication round all the works, facilitates sallies and retreats and the reception of auxiliaries, compels the enemy to begin his operations at a distance, checks his approach and the erection of breach batteries, and its parapet protects the fortifications in its rear.

COVERTURE, a legal term applied to the position of a woman during marriage, because she is under the cover or protection of her husband. See HUSBAND AND WIFE.

COWALL, a peninsular district of Argyleshire, about 30 miles in length, and varying from 10 to 15 miles in breadth, bounded W. and N.W. by Loch Fyne, E. by Loch Long and the Frith of Clyde, and S. by the Bay and Kyles of Bute. It is hilly, and its coast is indented, partly rugged, and has numerous creeks, arms of the sea, and small harbours. It contains several parishes.

COW-BUNTING. The chief interest attaching to this bird is the similarity of its instinct to that of the cuckoo, as regards its nesting. The cow-bunting (*Molothrus pecoris*, Sws.) is a member of the family *Icteridæ*, its nearest ally being *Quiscalus versicolor*, or American blackbird. The cow-bunting has a short, strong, conical bill; the wings, of which the first three primaries have equal length, reach to the middle of the tail, and that, again, has the feathers widened towards the end, so that the sub-family, including *Molothrus* and *Quiscalus*, is also known as the boat-tails. The cow-bunting, which feeds on insects almost entirely, and finds these most abundantly in the neighbourhood of cattle, lays its eggs in the nests of other birds, and leaves its young to be brought up by them, as does the cuckoo. The eggs are not all laid at the same time, but at intervals, a circumstance unfavourable for their continuous hatching; and the bird, shy and erratic in its habits, would therefore be apt to abandon its young, a risk from which vicarious hatching protects them. Other members of the family *Icteridæ* have the same habit, and these will be spoken of under ICTERIDÆ (which see). It is an interesting point that the family is an American one, the presence or absence of vicarious nesting being therefore capable of explanation by reference to the history of the group.

COWES, WEST, a seaport town and watering-place, England, Hampshire, on the north coast of the Isle of Wight, and on the left bank of the Medina, at its mouth. It is situated on an acclivity, the houses rising from the river to the summit. The parish church of Northwood is an ancient edifice, with a handsome tower and spire built in 1864. The only other notable public structures are the market-house; the town-hall, containing the mechanics' institution; the custom-house, an elegant stone building; several handsome hotels; and the castle, which stands at the north extremity of the Marine Parade, and is used by the Royal Yacht Squadron as their

club-house. A considerable trade is prosecuted here in provisions and other articles for the supply of the shipping. Ship-building is carried on to a pretty large extent; some vessels of war, many fine steamers, including some of the Peninsular and Oriental Company's ships, and some of the finest boats of the Royal Yacht Squadron have been built here. There is an extensive ropery, and sail-making is largely carried on. The harbour, which is much frequented, is finely sheltered, and perfectly safe; and the roadstead affords excellent and secure anchorage. The season for the yachts at Cowes is from the middle of May to the 1st November. A regatta is held here annually. Cowes is much resorted to as a bathing place, being considered one of the finest watering-places in England. Pop. 5730.

East Cowes is situated on the right bank of the Medina, directly opposite West Cowes, with which it communicates by a steam-ferry. Ship and yacht building is extensively carried on. There are large storehouses and bonding warehouses. East Cowes Castle and Norris Castle are in the vicinity. At a short distance east from the town is Osborne House, one of the summer residences of her majesty Queen Victoria. It is situated on a spacious lawn sloping to the sea, and commands a series of the most beautiful and extensive views. Pop. in 1871, 2058.

COW-ITCH, or Cow-hage, a term of uncertain origin, but supposed to be a corruption of the Bengali *al-kooskie*, is applied to hairs found upon the pods of several species of *Mucuna*, a genus of the order Leguminosæ. The hairs, which are very slender and brittle, when applied to the human skin fasten upon it and produce an intolerable itching. They are hence sometimes employed for mere mischief, but are also mixed with syrup and administered internally as a vermifuge. The pods, containing from one to six seeds, are covered with a wrinkled shrivelled skin, and before they are ripe form entire a delicious vegetable used in the same way as haricots. The plants, which are large and twining, resemble the haricot in their leaves, and produce dark-purple papilionaceous flowers. They grow in hedges and thickets on the banks of streams in the East Indies and in tropical America. The species from which cow-itch is usually obtained is *Mucuna pruriens*.

COWLEY, Abraham, an English poet of great celebrity in his day, was born at London in 1618. He was admitted into Westminster School as king's scholar. He became a correct classical scholar, and so early imbibed a taste for poetry that, in 1633, while yet at school, he published a collection of verses, which he entitled Poetical Blossoms. In 1636 he was elected a scholar of Trinity College, Cambridge, where he soon obtained great literary distinction, and published in 1638 a pastoral comedy, entitled Love's Riddle, and another in Latin, called Naufragium Joculare, which was acted before the university by the members of Trinity College. He continued to reside at Cambridge until 1643, when he was ejected by the Puritanical visitors; on which he removed to St. John's College, Oxford, where he published a satirical poem entitled the Puritan and the Papist. He engaged actively in the royal cause, and was honoured with the friendship of Lord Falkland. When the queen was obliged to quit England Cowley accompanied her. He was absent from his native country nearly ten years, during which time he undertook various journeys for the royal family; and it was principally through him that the correspondence was maintained between the king and queen. In 1647 appeared his collection of amatory poems entitled the Mistress. This was followed in 1650 by a comedy called the Guardian, afterwards altered into the Cutter of Coleman Street. In 1656, being no longer employed abroad, he returned to England, where, it is presumed, he still remained a medium of confidential communication between the king and the royal party. Soon after his arrival he published an edition of his poems, containing most of the works which appear in the final collection. He was about this time committed to custody by the ruling powers, but was released on the celebrated Dr. Scarborough becoming bail for him to the amount of £1000. For the purpose, probably, of appearing in an ostensible character, he assumed the profession of physic, and had sufficient interest to procure a mandamus from Oxford in 1657. He again visited France, and resumed his functions of agent in the royal cause on the death of Cromwell. On the Restoration he returned with the other royalists. By the interest of the Duke of Buckingham and the Earl of St. Albans he obtained the lease of a farm at Chertsey, held under the queen, by which his income was rendered about £300 per annum. He died in July, 1667.

In 1660 Cowley took part in founding the Royal Society; in 1661 he published a Proposition for the Advancement of Experimental Philosophy; and a Discourse by Way of Vision concerning the Government of Oliver Cromwell, which is pronounced by Bishop Hurd one of the best of the author's prose works. He published two books of a Latin poem on plants in 1662; he afterwards added four more books, and the whole, together with other pieces, was published in 1678 under the title of Poemata Latina. A poem on the Civil War appeared in 1679; his Select Works, with Preface and Notes by Bishop Hurd, were published in 1772–77 (three vols.)

Cowley's style, both in prose and verse, has been highly commended by critics; but his poems have failed to maintain their ancient popularity. The wit for which they were once celebrated has become obsolete, and he is now little read; but Charles Lamb speaks highly of him as a poet, and Hazlitt as a prose writer.

COWLOON, or Kowloon, a district in China, forming a peninsula at the mouth of the Canton River, province of Quantong, directly opposite to the island of Hong-Kong, of the harbour of which it also forms the northern shore. It was ceded to Great Britain by the Convention of Pekin, concluded on 24th Oct. 1860, between Lord Elgin and Prince Hung, and was formally taken possession of on behalf of her majesty on 18th January following. Its acquisition had been rendered a desirable object in consequence of its being the favourite resort of pirates and other desperadoes.

COWPER, William, a distinguished poet and epistolary writer, son of the Rev. John Cowper, chaplain to George II. and rector of Berkhampstead, Hertfordshire, was born at Berkhampstead on the 15th November, 1731. He lost his mother at the age of six, and was then placed in a boarding-school kept by Dr. Pitman in Hertfordshire. After remaining there two years he was threatened with the loss of sight, and was placed for the next two years in the house of a celebrated female oculist. At the age of ten he was sent to Westminster School, which he left at eighteen with a fair reputation for classical learning, and a horror of its discipline, which he afterwards expressed in his Tirocinium. He was then articled for three years to a solicitor; where he had for a fellow-clerk Mr., afterwards Lord Thurlow. His disposition was equally ill-suited to the rough discipline of the public school, and the total absence of restraint in his new position. Being of a highly nervous and susceptible temperament, strongly inclined to causeless melancholy and predisposed to insanity, he had also the occasional gaiety, the love

of ease and luxurious indolence, incident to a delicate constitution, the full indulgence of which probably aggravated the dread of active exertion and responsibility which afterwards brought such disastrous consequences. He writes of this period to his cousin, Lady Hesketh, 'I did actually live three years with Mr. Chapman, a solicitor—that is to say, I slept three years in his house; but I lived, that is to say, I spent my days, in Southampton Row, as you very well remember.' At the expiration of his apprenticeship he took chambers in the Middle Temple, and in 1754 was called to the bar. His life at the Temple was merely a continuation of his life with Mr. Chapman. He visited his cousins along with Mr. Thurlow, and made love to one of them, Theodora Cowper. He associated with other young men inclined to literature, Bonnel, Thornton, Colman, and Lloyd, formed a member of a club called the Nonsense Club, and contributed to the Connoisseur, commenced by Thornton and Colman. It was at the beginning of this period the tendency to his dreadful malady first manifested itself. 'I was struck,' he says, 'not long after my settlement in the Temple, with such a dejection of spirits as none but they who have felt the same can have the least conception of. Day and night I was upon the rack, lying down in horror and rising up in despair.' It was at the close of his residence in the Temple, which lasted eleven years, in 1763, that the first crisis of this malady occurred. Cowper's family was possessed of considerable influence, his grandfather was the younger brother of Lord-chancellor Cowper, and it had been the intention of his family in bringing him up to the law to secure him an appointment in the House of Lords. In this year several clerkships fell vacant, which were supposed to be at the disposal of his cousin. Two of them were conferred on him, the duties of which required him to appear before the house. These his nervousness induced him to relinquish, and accept that of clerk of the journals, which did not entail any public duty. Unfortunately his cousin's right to make this presentation was questioned, and it became necessary that he should submit to an examination at the bar of the house. He was now in a mortal dilemma. Many motives, among which the chief was the honour of his friend, made him feel it an imperative duty to answer the citation; but the more inevitable the necessity of his public appearance seemed, the higher rose his horror of undertaking it. He even looked forward as a relief to the approach of insanity, and finding it too slow he attempted suicide; but this too failed, and on the very day appointed for the examination he resigned the office, and soon after became insane. From December 1763 to June 1765 he remained under the care of Dr. Cotton at St. Alban's. The form assumed by his malady was that of religious doubt and despondency. The Calvinistic views he had adopted in regard to election, and his own powerful and susceptible imagination, made these doubts assume the most dreadful form. He was continually haunted with the belief that he had sinned beyond forgiveness, and that eternal misery of the most aggravated kind was ready to overtake him. On his recovery he settled at Huntingdon, and made the acquaintance of the Rev. Mr. and Mrs. Unwin, whose kindness, particularly that of the latter, seemed to have the most soothing and beneficial influence on him. On the death of Mr. Unwin, in 1767, he removed with Mrs. Unwin to Olney, the residence of the Rev. John Newton, who also became an intimate friend and exercised a powerful influence over his mind and conduct. A constant devotion to religious duties was the characteristic of the evangelical school to which Mr. Newton belonged, and to which Cowper endeavoured to conform. Newton had resolved on publishing a volume of hymns, and secured the co-operation of Cowper in composing them, but before their publication in 1776 he had been again attacked by his constitutional malady, by which for ten years from 1773 his mind, with occasional intervals of recovery, was continually clouded. In 1776, by Mrs. Unwin's advice, he commenced a poem on the Progress of Error, which he followed by three other poems, Truth, Table-talk, and Expostulation; these with some others were published in a volume in 1782. Another female friend, Lady Austen, suggested the Task, which, together with Tirocinium, formed a second volume in 1785. The History of John Gilpin is also due to the suggestion of Lady Austen. The translation of Homer, begun in 1784, occupied him for the next six years, and was published in 1791. He removed during its progress, in 1786, from Olney to Weston. In the beginning of 1794 he was again attacked with madness, which was aggravated by the death of Mrs. Unwin in 1796. During intervals of relief he revised his Homer, and composed some short pieces. In the beginning of 1800 he was attacked by dropsy, and died on 25th April, still in deep despondency. The Task unites minute accuracy with great elegance and picturesque beauty; and after Thomson, Cowper is probably the poet who has added most to the stock of natural imagery. The moral reflections in this poem are also exceedingly impressive, and its delineation of character abounds in genuine nature. His religious system too, although discoverable, is more cheerfully exhibited in this than in his other productions. His version of Homer possesses much exactness as to sense, and is certainly a more accurate representation of Homer than the version of Pope; but English blank-verse cannot sufficiently sustain the less poetical parts of Homer, and the general effect is bald and prosaic. Since his death Cowper has, by the care and industry of his friend and biographer, Hayley, become known to the world as one of the most easy and elegant letter-writers on record.

COW-PLANT, or KIRIAGHUNA (*Gymnema lactiferum*), belongs to the order Asclepiadaceæ, and instead of participating in the acrid and dangerous properties usually characteristic of the order, produces leaves which, when boiled, are used as vegetables, and yields a juice which forms a nutritious milk. It is found in the island of Ceylon.

COW-POX is a disease affecting the cow, which, by the discovery of Dr. Jenner, has been made the means of securing to human subjects considerable immunity from the attacks of small-pox. This is effected by means of Vaccination (which see).

COWRIE-SHELL (*Cypræa moneta*, or money cowrie) is a current coin in Siam, Bengal, and Africa. In Bengal 3200 are reckoned to be equivalent to a rupee, or about two shillings of British money. Five bearers are required to carry £10 worth of cowries. Hundreds of tons of money cowries are annually imported from the eastern seas into this country, whence they are exported to be used in trading with the natives of Africa, &c. In the genus *Cypræa*, to which the cowrie belongs, the shell is oval and convex, the mouth linear, notched at both ends, thickened and toothed on each side in the adult shell; and the animal has a large mantle, the lobes of which are capable of almost entirely investing the shell, to which it imparts a glossy surface. The *C. Europæa* of our shores affords an interesting illustration of the structure of the shells of this genus, and the habits of the molluscs.

COWSLIP (*Primula veris*), a species of primrose common in the pastures of England and on the Continent. The leaves are shorter than those of the

primrose. The flowers hang in an umbel or bunch, with a leafy involucrum, instead of each flower rising on a separate stalk like the primrose. It grows in moist and open situations, and flowers in May. Both single and double varieties are cultivated in gardens. The double cowslip has the corolla so multiplied as to form a full flower, like a double rose. The flowers are sometimes used as an anodyne. Fermented with sugar they make cowslip wine.

COW-TREES, a name applied to plants remarkable for the quantity of milky and often nutritious juice which they yield. The *palo de vaca*, or cow-tree of South America (*Galactodendron utile*), a plant of the order Artocarpaceæ, to which the breadfruit also belongs, yields a copious supply of a rich and wholesome milk, equal to that of the cow. *Tabernæmontana utilis*, commonly named *hya-hya*, belonging to the order Apocynaceæ, is another milk-producing tree. The juice of the *Galactodendron utile* was examined by Dr. T. Thomson, of Glasgow, in 1829. It was white and creamy, had a sour smell and acid reaction, due to acetic acid, and by evaporation and exhaustion of the residue with alcohol yielded a waxy substance to which the name *galactin* was given. The existence of this body has not been confirmed, and indeed little or nothing is known about the constituents of the juice of the different trees.

COX, David, a distinguished water-colour and landscape painter, was born in 1783, in Birmingham, where his father was a smith. He early showed a turn for drawing, and when he got older maintained himself by painting small pictures and ornamenting articles of Birmingham manufacture. He then got connected with Mr. Macready, father of the celebrated actor, and manager of the Birmingham theatre, to whom he became scene-painter. With his dramatic staff he visited some of the principal towns of England, and at last went up to London, where he formed an engagement as scene-painter with Astley, and travelled with him to different parts of the country. Thereafter, in deference to the wishes of his parents, he quitted the stage, and again resorted for subsistence to his water-colour drawings, an occupation which in those days was much more lucrative than now. Through the patronage of Colonel Windsor, afterwards Earl of Plymouth, he obtained an appointment as drawing-master in connection with the Military College of Sandhurst, but from dislike of the punctuality and routine thereby rendered necessary, soon abandoned it and returned to his former mode of life. The numerous works exhibited by Cox at different times in the gallery of the Water-colour Society are chiefly of English landscape, a department which constituted his peculiar walk. He has been called the high-priest of rustic nature, and nothing can be more charming than his representations of the fields, cottages, and hedgerows of his native country, varied at times by views of the grandeur and more romantic scenery of Wales. His work on Landscape-painting and Effect in Water-colours, published in London in 1814, is much esteemed. He died at Harborne, near Birmingham, on 7th June, 1859.

COXE, William, a historian and traveller, born in London, 1747, was educated at Eton and Cambridge, and successively accompanied several young men of the first English families on their travels in Europe, in the capacity of tutor. He published an account of his travels through Switzerland (1779), and through Poland, Russia, Sweden, and Denmark (1784–92), which are highly esteemed, and have been translated into almost all the languages of Europe. As an historian he brought himself into notice by his Memoirs of Sir Robert Walpole, in 1798, which were followed by those of Horatio, lord Walpole, in 1802. He then published his History of the House of Austria (1807), which has been translated into German; afterwards his Memoirs of the Kings of Spain, of the House of Bourbon, from 1700 to 1788 (1813, three volumes, 4to). Marlborough's Life and Original Papers (1818) is a valuable work. He died in 1828.

COXIS, or Coxcie, Michel J. van, a painter and engraver, born at Mechlin about 1500. He was a pupil of Bernard van Orley, and travelled to Rome, where he remained several years, attracted by the works of Raphael, with whom he was probably personally acquainted. Here he executed several paintings in fresco, and many other pieces. He also painted the History of Cupid and Psyche, in the style of Raphael, which was engraved on thirty-two copperplates. In the Imperial Gallery of Vienna we find a Madonna with the Infant Jesus by him. His works are rare, even in the Netherlands. He died in 1592.

COYPEL, Noël, a French painter, born in 1628 or 1629; died in 1707, at Paris. After he had embellished, by the royal command, the old Louvre with his paintings (from the cartoons of Lebrun), and had in like manner adorned the Tuileries, he was appointed a director of the French Academy in Rome. His four pictures for the Council Hall at Versailles —Solon, Trajan, Severus, and Ptolemy Philadelphus —excited the admiration of connoisseurs. His chief works are, the Martyrdom of St. James (in the church of Notre Dame), Cain Murdering his Brother (in the Academy), the Trinity and the Conception of the Holy Virgin (in the Hôtel des Invalides). Coypel had a rich imagination, drew correctly, understood expression, and was an agreeable colourist.

COYSEVOX, Antoine, a sculptor, was born at Lyons in 1640, and went to Alsace in his twenty-seventh year to adorn the beautiful palace of the Cardinal Fürstenberg, at Saverne. In 1676 he became a member of the Academy of the Arts of Painting and Sculpture, and executed several busts of Louis XIV. and other works for the royal palaces. His figures are full of grace, natural, and noble. He was called the *Vandyke of sculpture* on account of the beauty and animation of his portraits. The statue of Cardinal Mazarin, in the museum at Paris, is a masterpiece of art. Besides this, his most distinguished works are a statue of Louis XIV., on horseback; the tomb of Colbert; the statues representing the Dordogne, Garonne, and Marne; the group of Castor and Pollux; the Sitting Venus; the Nymph of the Shell; the Hamadryad; the Faun with the Flute; Pegasus and Mercury. Coysevox died at Paris in 1720.

COZUMEL, an island in the Caribbean Sea, off the coast of Yucatan, lat. 20° 34′ N.; lon. 86° 44′ W. It is 30 miles long, by about 8 miles broad, and is low, flat, and covered with trees. It is fertile, and abounds in fruit and cattle. Numerous interesting remains of ancient buildings have been discovered on it. When visited in 1518 by Juan de Grijalva it contained a numerous population, and was much resorted to as a place of peculiar sanctity by the Indians of the neighbouring continent.

CRAB (*Cancer*, Linn.) This name, which appears to be derived from the Greek *karabos*, through the Latin *carabus*, used by Pliny to designate certain species of crustaceans, is now applied to a considerable group of invertebral animals whose bodies are covered by an external skeleton or calcareous crust, having ten articulated limbs adapted for swimming or walking, and breathing by *branchiæ*, or gills. The head and thorax are united, and are covered by a shield or carapace, which is broader than it is long. The tail is short in proportion, and concealed by being turned forward beneath the body.

This genus is distinguished from all others of the same family by the semicircular shape of the corselet, the pointed or hooked extremities of the last joint of the limbs, the narrowness of the superior shell from before backwards, the posterior direction of the hinder *tarsi*, and the absence of spines or ridges from the *chelæ* or nippers. They belong to the fourth section of the ten-legged, short-tailed crustaceans (*Decapoda brachyura*) of the latest systems, and are of numerous species, exceedingly various in size, colour, and modes of living. The eyes are at the end of movable stalks or peduncles, and the sense of sight is peculiarly acute, enabling them to distinguish the approach of objects from a very considerable distance. The organ of hearing is in the basal joint of the second *antenna*, and consists of a small, hard, triangular prominence, covered by a membrane, within which is a cavity containing the expanded auditory nerve. The senses of taste and smell are probably combined, and the combined function, which thus resolves itself into a kind of tactile sensibility, is perhaps confined to the mouth and its margins. Decaying bodies attract crabs under circumstances which render it impossible that sight could assist them: the sapid particles floating about may enter the mouth, and the animal thus follow up the train of fragments. Though the body is covered with a hard shell, and thus tactile sensibility must be slight over the general surface, the acuteness of the senses compensates for their limited surface. The *antennæ* are highly sensitive, and the tips of the walking limbs (not the nippers) are very delicate tactile organs, especially in some of the land-frequenting crabs, as in the violet flat crab of Jamaican morasses. The mouth is surrounded by six pairs of limbs, three of which, viz. *mandibles* and two pairs of *maxillæ*, belong to the head; the other three are the first thoracic limbs modified into accessory jaws, and known as *maxillipeds*, or jaw-feet. The stomach is supported on a cartilaginous framework, the pieces of which are articulated together so as to have considerable range of motion. These, in crabs, are five in number, and placed at the pyloric extremity, or outlet of the stomach; so that the aliment, after being subjected to the action of the jaws, is again more perfectly chewed by the stomach-teeth before entering the digestive tube, where it is exposed to the action of the biliary fluid of the liver. The latter organ is of great size in these creatures, and is all that soft, rich, yellow substance found immediately beneath the superior shell, usually called the *fat* of the crab, and justly esteemed a delicious morsel. A little posterior to the stomach (commonly called *sandbag*) the heart is situated—a somewhat globular, whitish body, which propels a colourless lymph to the gills (called *dead man's flesh* or *fingers*) and rest of the body, whence it is brought back to the heart by a vein (*vena cava*) of considerable size.

The process of sloughing, moulting, or throwing off the entire calcareous covering which constitutes their only skeleton is common to all the Crustacea, and is very worthy of attention. As it is obvious that the hard shell, when once perfected, cannot change with the growth of the animal, it becomes necessary that it should be shed entirely; and this shedding takes place at regular periods, at which the increase of size occurs. No one can behold the huge claws or *forceps* of various species, and the smallness of the joints between them and the body, without feeling some surprise that the creature should be able to extricate them from the old shell, though this is readily accomplished. The aquatic crabs, when the season of shedding arrives, generally seek the sandy shores of the creeks and rivers, and having selected a situation, they remain at rest, and the change begins. The body of the crab seems to swell, the large upper shell is gradually detached at the edge, or where it joins the thorax or corselet, and the membrane gradually gives way and rises up from behind, somewhat like the lid of a chest. The crab next begins to withdraw the limbs from their cases, and the large muscles of the claws undergo a softening, which allows of their being drawn through the smaller joints. In some species, if not in all, the sheath of the limbs splits longitudinally so as to facilitate the withdrawal. This movement is slowly effected, and at the time it is accomplished the parts about the mouth, the antennæ and eyes, are withdrawn from their old cases, and the animal escapes, retaining his original figure, but soft, helpless, and incapable of exertion or resistance. By a gentle and not very obvious motion we next observe the sand displaced below the body, and the crab begins to be covered with it, until at length he is sufficiently covered for safety, though still in sight. This is generally in shallow water, where the sun shines freely upon the bottom; and in the course of twelve hours the external membrane begins to harden so as to crackle like paper when pressed upon, and the process of hardening goes on so rapidly that by the end of the next forty-eight hours the crab regains something of his former solidity and ability to protect himself by flight or resistance. Myriads of these animals are caught on the shores of the rivers and creeks of the Chesapeake Bay in America when in their soft state, and sold to great advantage. At Baltimore, Annapolis, or Easton in Maryland, in July and August, soft crabs are accounted one of the highest luxuries of the table, and fairly dispute the palm with canvass-back ducks, also to be obtained in perfection in Baltimore during the winter.

The habits of crabs are very various: some are exclusively aquatic, and remain on the sands or rocks at great depths in the sea; others inhabit excavations formed in the soft coral reefs or bars on certain coasts; some spend their days altogether on shore, living in burrows or dens formed in a moist or boggy soil; others resort to the rocky flats or beaches to bask in the sun, where only an occasional wave dashes over them, and seek refuge in the sea when alarmed; while some species are completely terrestrial, inhabiting holes upon the highest hills and mountains of the West Indies. Of these land-crabs the most remarkable is the species formerly so abundant in the highlands of Jamaica (*Gecarcinus ruricola*), and still common in less densely peopled or uninhabited islands. When the season for spawning arrives vast armies of them set out from the hills, marching in a direct line towards the sea-shore for the purpose of depositing their eggs in the sand. On this grand expedition nothing is allowed to turn them from their course. With unyielding perseverance they surmount every obstacle which may intervene, whether a house, rock, or other body, not avoiding the labour of climbing by going round, but ascending and passing over it in a straight line. Having reached the destined limit of their journey, they deposit their eggs in the sand, and recommence their toilsome march towards their upland retreats. They set out after nightfall, and steadily advance until the approach of daylight warns them to seek concealment in the inequalities of the ground, or among any kind of rubbish, where they lie ensconced until the stars again invite them to pursue their undeviating course. On their seaward journey they are in full vigour and fine condition; and this is the time when they are caught in great numbers for the table. Their flesh, which is of the purest whiteness, is highly esteemed, but like that of all crustaceous animals is rather difficult of digestion. Returning from the coast they are exhausted, poor, and no longer fit for use. They

then retire to their burrows and slough or shed their shells, after which operation, and while in their soft state, they are again sought by epicures. Seeing they are so much valued as an article of food, it is not surprising that their numbers should be exceedingly diminished or quite extinguished in populous islands, where multitudes are annually consumed before they have deposited their eggs for the continuance of the species. Besides this cause of diminution, they are destroyed in great numbers by other animals, and numbers of them perish from exhaustion and injury on their homeward progress. When the eggs are hatched the young in like manner seek the hills, and pursue the course of life peculiar to their race.

Crabs generally subsist upon animal matter, especially in a state of decomposition, though some of them are very fond of certain vegetable substances. This is especially the case with the swift-running or racer-crabs, which live in burrows made in a soft or watery soil in the vicinity of sugar-cane fields. From their numbers and activity they become a great nuisance, destroying large quantities of cane by cutting it off and sucking the juice. They sometimes increase to such a degree, that, in conjunction with the rats and other destroyers of the cane, they blight the hopes of the planter, and completely spoil his crop. Their excavations in the soil are so deep and extensive, and it is so very difficult to catch or destroy them in any way, that they may be regarded as seriously subtracting from the value of estates situated near the sea or where they are abundant.

No one who has not made the experiment could readily believe the great distance at which these marauders descry an approaching pursuer, nor the extraordinary celerity with which they escape. Few men can run with sufficient swiftness to overtake them; and even when from any accident the pursuer is led to hope that he has cut off the retreat of his victim, the wonderful facility they have in running, or rather darting in any direction, or with any part of their bodies foremost, almost uniformly enables them to elude capture and recommence their flight. It is seldom, however, that they leave the mouths of their dens or go to a distance from them in the daytime; and their vigilance is such that they regain them in a moment and disappear securely as soon as a man or dog comes near enough to be seen. The species which daily bask in the sun on the rocky shores of the West India Islands are quite as vigilant and very little inferior in swiftness to those above mentioned. Some of them are very large, splendidly coloured, and well suited to excite the wishes of a naturalist to add them to his collection. Many an hour of anxious watching, and many a race of breathless eagerness have they caused the writer in vain. A number of species of crabs occur in the British seas, the best known of which is the common edible crab, *Cancer pagurus*. These are very commonly caught in crab-pots, which are baskets of a rounded form, with an aperture at the top by which the crab enters, but from which it is prevented from escaping by a circle of willow-rods surrounding the aperture, and projecting into the interior of the crab-pot.

CRAB, in ship-building, a sort of wooden pillar, whose lower end, being let down through a ship's decks, rests upon a socket like the capstan. It is employed to wind in the cable or to raise any weighty matter. It differs from the capstan by not being furnished with a drum-head, and by having the bars going entirely through it.—The same name is given also to a portable wooden or cast-iron machine fitted with wheels and pinions similar to those of a winch, of use in loading and discharging timber vessels, &c.

CRAB-APPLE. See Apple.

CRABBE, George, a distinguished modern English poet, was born at Aldborough, a small village on the coast of Suffolk, on Christmas-eve, 1754. Having been educated for the medical profession, he settled as a surgeon and apothecary in his native village, but soon finding his practice insufficient to afford him a livelihood, he resolved to abandon it, and trust to his talents for poetry for support. With this view he proceeded to London, and after a year spent in that most trying of all situations, that of a literary adventurer without fortune and without friends—a situation from the miseries of which the unfortunate Chatterton, 'the wondrous boy,' escaped by suicide—when on the point of being thrown into jail for the little debts which he had unavoidably contracted, as a last resource, in an auspicious moment, he applied to Edmund Burke for assistance, transmitting to him at the same time some verses as a specimen of his abilities. In these sketches Burke at once recognized the hand of a master. He invited the poet to Beaconsfield; installed him in a convenient apartment; opened up to him the stores of his library; watched over his progress, and afforded him the benefit of his taste and critical skill. Under his auspices the Library was prepared for publication, and by it Crabbe was at once raised to fame. But the efforts of Burke did not stop here. By his advice and assistance—notwithstanding the irregularity of his education—Crabbe was admitted to holy orders, appointed domestic chaplain to the Duke of Rutland, and afterwards obtained ample preferment. In 1783 appeared the Village, which placed Crabbe's reputation on a permanent basis. Two years afterwards it was followed by the Newspaper. The Parish Register appeared in 1807. In it Crabbe first fully developed the style which may be regarded as peculiarly his own—that minuteness, yet force and truthfulness of description, that searching analysis of human character, which stamps him as an original as well as a great poet. The Borough appeared in 1810, and was followed in 1812 by Tales in Verse, and in 1819 by Tales of the Hall. The latter years of Crabbe's life were spent in the peaceful discharge of his professional duties at Trowbridge in Wiltshire, where he died Feb. 3, 1832. A handy edition of his Works in one volume, with a Life by his son, and notes and illustrative engravings, is published by John Murray, London.

CRACOVIENNE, a lively Polish dance in two-fourths time, in which the dancers arrange themselves in couples, the one partner standing before the other. First one couple sings two stanzas to an air called the *Krakoviak*, while the other couples group themselves round, then another couple takes the place of the first, and so on in succession.

CRACOW, a city of the old Kingdom of Poland, afterwards capital of a republic of the same name, now comprised in the Austrian Empire, in the Kingdom of Galicia. It is situated on an extensive plain, on the left bank of the Vistula, at a point where many important commercial roads centre. It consists of Cracow proper, or the old city, surrounded with fortifications, walls, and ditches, and the suburbs of Stradom and Clepar on the left, and Casimir on the right bank of the river Vistula. Cracow is the see of a bishop, who formerly bore the title of *Duke of Severia*. The church of the castle (a Gothic building well worth seeing), the richest church in Galicia, contains the monuments of many Polish kings, the tombs of the famous Sobieski, of Jos. Poniatowski, of Kosciusko and Dombrowski. Of the other seventy-two churches, some are remarkable for their antiquity. In the church of St. Anna stands the marble monument of Copernicus. The University

of Cracow is one of the oldest in Europe. It was founded in 1361 by Casimir the Great, and during the early period of its history students flocked to it in great numbers from all parts of Poland, as well as Germany and Hungary. It gradually, however, fell into decay, chiefly through the schisms of the Jesuits. After being completely reorganized it was reopened on the 18th of October, 1817, but since 1833 several alterations have been made in its constitution. It is now attended by between 500 and 600 students. On one of the three hills near Cracow stands the monument of Kosciusko, 120 feet high. A town bearing the name of Wawel is said to have existed on the site of Cracow long before the time of Christ, and Wawel is still the name of the hill in Cracow on which the royal castle and the cathedral stand. But according to the common account Cracow did not acquire its present name until a prince of the name of Krakus established his residence there, and made it the capital of Poland. In 990 the town was taken by the Bohemians, but in 999 it was recovered by Boleslas the Great. It remained the capital of Poland until 1609, when the seat of government was transferred to Warsaw. On the division of Poland in 1795 Cracow fell to Austria, which had already taken possession of the suburb of Casimir. In 1809 it was, together with all West Galicia, made a part of the duchy of Warsaw. By an act of the Congress of Vienna (1815) Cracow, with a territory of 487 square miles, was declared a republic, to remain perpetually neutral, and to be governed according to the constitution of May 3, 1815, under the protection of Austria, Russia, and Prussia. The government, thus constituted, remained in being till the attempted revolution in Poland of 1846, during which the insurgents seized Cracow and its territory, but were soon expelled. The three protecting powers, on the 6th of November in that year, came to an agreement, by which Cracow with the surrounding territory was to be annexed to Austria, and this agreement was carried into effect by a patent issued by the Austrian government on the 11th of November. Pop. of Cracow in 1869, 49,834.

CRADLE, in ship-building, a frame placed under the bottom of a ship, in order to conduct her smoothly and steadily into the water when she is launched; at which time it supports her weight whilst she slides down the descent or sloping passage called the *ways*, which, to facilitate her passage, are daubed with soap and tallow.

CRAFT, in sea language, now a general name for lighters, hoys, barges, &c., employed to load or land any goods or stores. The term *small craft* is applied to the small vessels of war attendant on a fleet, such as cutters, schooners, gunboats, &c., generally commanded by lieutenants. It is also applied to all manner of nets, lines, hooks, &c., used in fishing.

CRAG. See GEOLOGY.

CRAIG, SIR THOMAS, a Scottish writer on jurisprudence, was probably born in the year 1538. He was first educated at the University of St. Andrews, and after graduating as Bachelor of Arts he repaired to France, and studied the civil and canon law in some of the flourishing universities of that country. He returned about the year 1561, and after distinguishing himself in a very eminent degree as a classical scholar, he was called to the bar in February 1563, and in the succeeding year was placed at the head of the criminal judicature of the country, as justice depute, under the hereditary officer, the justice-general, an honour vested in the noble family of Argyle. He pursued an extensive practice at the bar for a period of upwards of forty years. During the latter part of his career he devoted much of his time to the composition of his learned treatise on the Feudal Law, upon which his reputation principally rests, and which he completed in 1603. The treatise, which was written in a vigorous Latin style, was not, however, put forth to the world till forty-seven years after the death of the learned author. It would appear that Craig either was one of those who accompanied King James to England, or soon after followed him; as he was present at the entrance of his majesty into London, and at the subsequent coronation. He celebrated these events in a Latin hexameter poem. In 1604 he was one of the commissioners on the part of Scotland, who, by the king's desire, met others on the part of England, for the purpose of considering the possibility of a union between the two countries. He wrote a work on this subject, in which he warmly seconded the views of the king. This treatise, written, like all his other works, in Latin, has never been published. The work upon which he appears to have been last engaged (De Hominio) is one upon the old controversy respecting the homage claimed from Scotland by the English monarch. A translation of it was published by Mr. George Ridpath in 1695, under the title, Scotland's Sovereignty Asserted, or a Dispute concerning Homage. Craig died in 1608.

CRAIK, GEORGE LILLIE, a miscellaneous writer, who was born in Fifeshire in 1799, and died at Belfast, June 25, 1866. He was originally intended for the church, but preferring to devote himself to literature he removed to London in 1824 with the object of establishing a literary connection. He became an extensive contributor to the Penny Cyclopædia in the departments of history and biography. His first independent work of any imporance was his Pursuit of Knowledge under Difficulties. This was succeeded by his Romance of the Peerage; Spencer and his Poetry; History of Literature and Learning in England; History of British Commerce; English of Shakspeare; Bacon, his Writings and Philosophy; &c. From 1837 to 1844 he was joint editor of the Pictorial History of England. In 1849 he was appointed professor of English literature in Queen's College, Belfast, an appointment which he held till his death.

CRAIL, a royal and parliamentary burgh in Scotland, in the county of Fife, situated 8½ miles S.E of St. Andrews. It is a very ancient burgh, but is now somewhat decayed. Pop. in 1871, 1126.

CRAMBE, a genus of plants belonging to the natural order Cruciferæ, the sub-order Orthoploceæ, and the tribe Raphanidæ, distinguished by having the four longer stamens bifurcate, and a silicula with two articulated cells, the upper one globular, and the lower abortive. The best known member of this genus is the *Crambe maritima* of Linnæus, or sea-kale, a hardy perennial found on the coasts of England and Scotland, as well as France and the shores of the Baltic. The common people on the western shores of England have, from time immemorial, been in the practice of watching when the shoots begin to push up the sand or gravel in March and April, then cutting off the young shoots and leaf-stalks while still blanched and tender, and boiling them for food. When cultivated in gardens the young spring-shoots are blanched by being earthed up. The *Crambe tartarica* is also a perennial plant, and grows to the height of about 3 feet. Its radical leaves are multifid, dentate, and incised. In Siberia, where this species is very common, the root is very extensively used for food either boiled or dressed as a salad.

CRAMER, JOHANN ANDREAS, was born at Quedlinburg, Dec. 14, 1710. As a boy he disliked school-learning, and gave his guardian great trouble. Afterwards he showed a taste for geography, mathematics, and navigation, and was at length induced to acquire Latin. He then began the study of medicine, which

he relinquished, took up law, and acted as advocate; but at length devoted himself to chemistry, which he pursued at Helmstädt. He went to Holland, was made extra professor of chemistry at Leyden, gave lectures on the chemical analysis of ores and minerals, and published a work on the subject, entitled Elementa Artis Docimasticæ (Leyden, 1732), in two volumes. It was well received, and was translated into German, French, and English (London, 1741). It is one of the most satisfactory of the older treatises on chemical analysis, and exhibits the familiarity which chemists had even by this time acquired with the details of the reactions of mineral bodies. He next went to England, where he gave lectures, and intended to remain, but having to return to Helmstädt, he was induced to enter the Brunswick service, was made councillor on mines and metallurgy, and in that capacity introduced improvements which increased the profits while diminishing the cost. But differences with many persons, and his own high temper, brought him into difficulties which, though smoothed down for a time, forced him at last to leave the service. Subsequently he was engaged in mining operations in Saxony, in Hungary, and other places; but his temper seemed again to have produced a copious crop of opponents, who perhaps were envious of his talents, and irritated him as the best means of getting rid of him. In the middle of a number of unfulfilled plans he died, Dec. 6, 1777, at Berggiesshübel, near Dresden. Besides the work above mentioned, he wrote also on metallurgy and on forestry.

CRAMER, Johann Andreas, born Jan. 1723, at Jöhstadt, near Annaberg, in the Saxon Erzgebirge, studied theology at Leipzig in 1742, where he supported himself by his literary labours and private instruction. In connection with Ebert, Joh. Elias Schlegel, Gärtner, Klopstock, Rabener, and other young men whose labours had a favourable influence on the cultivation of the German taste, he was actively engaged in editing the Bremischen Beiträge, and likewise the Sammlung Vermischter Schriften von den Verfassern der Bremischen Beiträge. In 1754, by the influence of Klopstock, he was appointed court preacher and consistorial counsellor of King Frederick V. at Copenhagen, and in 1765 professor of theology in the same place. Here he was much respected and beloved, and received the surname *Der Eyegode* (the very good). The revolution which caused the downfall of Count Struensee and the Queen Caroline Matilda, occasioned also the disgrace of Cramer, and induced him in 1771 to accept of an invitation to Lübeck. In 1774, however, he was invited to Kiel as pro-chancellor and first professor of theology; and ten years after was appointed chancellor and curator of the university. He died in 1788. His poems (Gedichte) appeared in 1782–83, and his Biography of Gellert in 1774.

CRAMP (*kramp*, Dutch), in architecture and sculpture, pieces of iron, bronze, or other metal bent at each end, by which stones in buildings, and limbs, &c., of statues are held together. The ancient Romans made great use of cramps in their buildings, and the cupidity of modern barbarians, like Pope Barberini, has destroyed many a fine work for the sake of the bronze used in its construction. The Pantheon, with its fine portico, by Agrippa, and the Colosseum, have suffered most from these wanton aggressions; and the baldachin of St. Peter's, and some eighty pieces of brass ordnance, are nearly all that we have in exchange for some of the finest works of which the world could boast.

CRANACH, Kranach, or Kronach, Lucas, a German painter and engraver, born in 1472; died in 1553. His family name is said to have been Sunder, or Sünder, and the name by which he afterwards called himself is said to have been taken from his birthplace, a town near Bamberg, in Bavaria. In 1504 he received an appointment at the court of Frederick the Wise, elector of Saxony, and in 1508 he was ennobled. In 1509, by the desire of Frederick, he travelled through the Netherlands (which he had previously visited). At Malines he painted the portrait of the future Emperor Charles V., then a child of nine years old. Everywhere he was received with respect and admiration. He was suddenly recalled from the Netherlands, in order to accompany Frederick on his pilgrimage to Jerusalem. On the outbreak of the Reformation movement he became the intimate friend of Luther, of whom he painted several portraits, which are still celebrated. After the death of the elector Frederick he still remained attached to the Saxon court, for he received as much favour from Frederick's successors—John the Constant and John Frederick the Magnanimous. After the battle of Mühlberg, in 1547, in which John Frederick was taken prisoner by the troops of Charles V., Cranach showed his attachment to his master by following him from prison to prison until in 1552 he was set at liberty, when he returned with Cranach at his side to Weimar. The artist had now, however, reached an advanced age, and did not live much longer to enjoy the favour which he had merited by his devotion. The number of his paintings and engravings is immense, for Cranach was above all things remarkable for his rapidity of execution. He has painted a large number of Madonnas, the most celebrated of which are to be seen in the Sciarra Palace at Rome, the cathedral of Glogau, and the Pinakothek of Munich. Another favourite subject with him was Christ blessing the little Children. The most beautiful of his paintings on this subject are contained in the church of Naumberg, and in the collection of Th. Baring, of London. There is a remarkable picture by him in the cathedral of Mersier, representing Christ between Mary and John, with a choir of angels above.

CRANBERRY, a small red fruit produced by a slender, wiry plant (*Vaccinium oxycoccos*), growing in peat-bogs and marshy grounds in Russia, Sweden, the north of England, and Germany, and in North America. The leaves are small, somewhat oval, and rolled back at the edges, and the stem is thread-shaped and trailing. The blossoms are small, but beautiful, each consisting of four distinct petals, rolled back to the base, and of a deep flesh colour. The American cranberry (*V. macrocarpum*), growing in bogs principally, on sandy soils, and on high lands, frequent from Canada to Virginia, is a larger and more upright plant than the former, with less convex, more oblong, much larger leaves. The berries are larger, of a brighter red, and collected in great abundance for making tarts, jelly, &c. They are also exported to Europe, but are not considered equal to the Russian cranberries. These fruits are collected in America by means of a rake; in Germany, by wooden combs. In England they are picked by hand, as they grow there but scantily. They are preserved with sugar, much of which is required to correct the natural tartness of the berries. In England they are preserved dry in bottles, corked so closely as to exclude the external air; some persons, however, fill up the bottles with spring water. They keep very long in fresh and pure water. At sea they are an agreeable addition to the few articles of diet which can be had. The Tasmanian cranberry is a fruit about the size of a black currant, of a greenish or whitish colour, and with the flavour of an apple. It grows upon a shrub belonging to the Epacridaceæ. The cranberry is sometimes cultivated in this country for its fruit.

CRANBORNE, a market town and parish, England, Dorsetshire, 27 miles N.E. of Dorchester; pop. of township in 1871, 2562. It has a fine old church, with a Gothic tower, and is surrounded by a chase, famous in ancient times, and still tenanted by large herds of deer. The battle between Queen Boadicea and the Romans is believed to have been fought here, and the remains of a large circular fortification, as well as the discovery of numerous urns and bones, tend to confirm the belief.

CRANBROOK, a market town and parish, England, county Kent, 40 miles S.E. of London; pop. of township in 1871, 4331. It has a beautiful church, and a grammar-school founded by Queen Elizabeth. The first woollen manufactory in England was established here by the Flemings in the reign of Edward III. Its chief trade is now in hops.

CRANE (*Grus*, Pal., &c.), a genus of birds belonging to the order Grallæ, or Grallatores; and by the great Swedish naturalist comprised in his extensive genus *Ardea*, though properly ranked as a distinct genus by all subsequent naturalists. The distinctive characters of this genus are as follow: The bill is but little cleft, is compressed, attenuated towards the point, and rather obtuse at its extremity; the mandibles are subequal, with vertical margins, the upper being convex, with a wide furrow on each side at the base, which becomes obliterated before reaching the middle of the bill. The nostrils are situated in these furrows, and are medial-concave, elliptical, pervious, and bounded posteriorly by a membrane. The tongue is fleshy, broad, and acute. The ophthalmic region and lora are feathered, though the head is generally bald, rough, and sometimes crested. The body is cylindrical, having long and stout feet. The naked space above the tarsus is extensive, and the latter is more than twice as long as the middle toe. The toes are of moderate length, covered with *scutellæ*, or small plates, and submargined; a rudimental membrane connects the outer one at base; the inner is free; the hind toe is shorter than a joint of the middle one, and is articulated with the tarsus, elevated from the ground; the nails are tile-shaped, falculate, and obtuse; the middle one has its cutting edge entire; the hind nail is the longest; the wings are moderate, with the first and fifth primaries subequal; the tail is short, and consists of twelve feathers.

These birds are generally of considerable size, and remarkable for their long necks and stilt-like legs, which eminently fit them for living in marshes and situations subject to inundations, where they usually seek their food. This is principally of vegetable matter, consisting of the seeds of various plants, or grains plundered from grounds recently ploughed and sown. They also devour insects, worms, frogs, lizards, reptiles, small fish, and the spawn of various aquatic animals. They build their nests among bushes, or upon tussocks in the marshes, constructing them of rushes, reeds, &c., surmounted by some soft material, so high that they may cover their eggs in a standing position. They lay but two eggs, for the incubation of which the male and female alternately take their place on the nest. During the time that one is thus engaged, the other acts as a vigilant sentinel; and when the young are hatched, both parents unite in protecting them.

The cranes annually migrate to distant regions, and perform voyages astonishing for their great length and hazardous character. They are remarkable for making numerous circles and evolutions in the air when setting out on their journeys, and generally form an isosceles triangle, led by one of the strongest of their number, whose trumpet-like voice is heard as if directing their advance, when the flock is far above the clouds and entirely out of sight. To this call-note of the leader the flock frequently respond by a united clangour, which, heard at such a distance, does not produce an unpleasant effect. From the sagacity with which these birds vary their flight, according to the states of the atmosphere, they have, from the earliest ages, been regarded as indicators of events; and their manœuvres were attentively watched by the augurs and aruspices—a circumstance which, together with their general harmlessness and apparent gravity of demeanour, led to their being held in a sort of veneration, even by some civilized nations. When obliged to take wing from the ground, cranes rise with considerable difficulty, striking quickly with their wings, and trailing their feet along and near the ground until they have gained a sufficient elevation to commence wheeling in circles, which grow wider and wider until they have soared to the highest regions of the air. When their flight is high and silent, it is regarded as an indication of continued fine weather; they fly low and are noisy in cloudy, wet, or stormy weather. Against approaching storms the cranes, like various other birds of lofty flight, readily guard by ascending above the level of the clouds, and the atmospheric currents which bear them; and this indication of an approaching gust is not lost sight of by Virgil:—

> '—— Nunquam imprudentibus imber
> Obfuit: aut illum surgentem vallibus imis
> Aëriæ fugêre grues; aut bucula,' &c.
>
> Georg. I. 373—5.

When a flock of cranes is engaged in feeding, or while it is at rest, and the birds are standing on one foot asleep, with the head under the wing, one of the number acts as sentinel and keeps a vigilant watch, alarming the whole if any enemy approach, or the slightest danger threaten.

The common crane (*Grus cinerea*) has the general plumage ash-gray, the throat black, the rump ornamented with long, stiff, and curled feathers, the head with bristly feathers, and bare on the top, which in the male is red; legs black, length about 4 feet. It inhabits Europe, Asia, and the north of Africa. In the spring cranes retire to the northern regions to breed, extending their wanderings to the polar circle; in the autumn they return to the south. Though at one time common in the marshy districts of Britain, the crane occurs now only as a straggler. The white crane (*G. leucogeranus*) is white, the quill feathers being black, and the feet red. It is about 5 feet long, and inhabits the neighbourhood of the Caspian Sea. The crowned crane (*G. pavonina*, or *Balearica pavonina*) has the general plumage bluish ash-gray, the tail and primary quills black, the wing coverts pure white; the occiput is crowned with a tuft of slender yellow feathers, which can be spread out at pleasure; it is about 4 feet long. It inhabits North and West Africa, and is not uncommon in Sicily and Malta. The demoiselle crane (*Anthropoides virgo*), so called from the elegance of its form, belongs to another genus. It is ash-gray, and the head is adorned with two tufts of feathers, formed by a prolongation of the ear coverts; its length is 3 feet. Its habitat is Africa and the south of Europe. Among North American species are the whooping crane (*G. Americana*) and the brown or sand-hill crane (*G. Canadensis*). The first-named derive their trivial appellation from their loud, clear, piercing cry, which may be heard at the distance of 2 miles. They are very shy and vigilant, and consequently shot with difficulty. Their general colour is pure white. The brown or sand-hill crane is of an ash colour, generally, with shades or clouds of pale brown and sky-blue; brown prevails upon the shoulders and back. It is a very stately bird, standing when erect

fully 5 feet high, and measuring 8 or 9 across the wings. The tail is quite short, but the feathers pendent on each side of the rump are very long, of a delicate silky softness, and sharp-pointed. The crown of the head is bare of feathers, and of a reddish rose colour, but thinly barbed with a short, stiff, black hair.

CRANE, a machine for raising great weights and depositing them at some distance from their original place, for example, raising bales from the hold of a ship and depositing them on the quay. Cranes are generally constructed on the principle of the wheel and axle, cog-wheel, or wheel and pinion. A very efficient wheel-and-pinion crane much used on quays, consists of a jib or transverse beam, inclined to the vertical at an angle of from 40° to 50°, which, by means of a collar, turns on a vertical arbor. The upper end of the jib carries a fixed pulley, and the lower end a cylinder, which is put in motion by a wheel and pinion. The weight is made fast to a rope or chain which passes over the pulley, and is wound round the cylinder. On turning the cylinder (either by a winch handle attached to the wheel which works in the pinion, or by the application of steam power) the weight is raised as far as necessary. The jib is then turned on its arbor, till the weight is brought immediately over the spot where it is to be deposited, and the moving power is withdrawn so as to allow the weight to descend by its own gravity.

CRANE, HYDRAULIC. See HYDRAULIC CRANE.

CRANGANORE (*Corangalur*), a town in Hindustan, in the presidency of Madras, on the Malabar coast, on the north margin of a small bay, 16 miles north of Cochin. It is the residence of a Roman Catholic archbishop, in whose diocese most of the inland churches, formerly belonging to the Nestorian community, are included. Syrian Christians have been settled here since 345, and Jews since 490 A.D.

CRANIOLOGY, a name sometimes used as synonymous with *phrenology*. See PHRENOLOGY.

CRANK, an iron axis with the end bent like an elbow, for the purpose of moving a piston, the saw in a saw-mill, &c., causing it to rise and fall at every turn; also for turning a grindstone, &c. The common crank affords one of the simplest and most useful methods for changing circular into alternate motion, and *vice versa*. Double and triple cranks are likewise of the greatest use for transmitting circular motion to a distance. In fact, cranks belong to those few simple elements on which the most complicated machines rest, and which, like the lever, are constantly employed.

CRANMER, THOMAS, famous in the English reformation, during the reign of Henry VIII., was born in 1489. He entered as a student of Jesus College, Cambridge, in 1503, took the degree of M.A., obtained a fellowship, and in 1523 was chosen reader of theological lectures in his college, and examiner of candidates for degrees in divinity. In the course of conversation on the then meditated divorce of Henry VIII. from his first wife, Catharine of Arragon, Cranmer remarked that the question of its propriety might be better decided by consulting learned divines and members of the universities than by an appeal to the pope. The opinion thus delivered having been reported to the king by Dr. Fox, his majesty was highly delighted with it, exclaiming, at the prospect it afforded him of being able to remove the obstacles to the gratification of his passions, 'By ——, the man has got the right sow by the ear!' Cranmer was sent for to court, made a king's chaplain, and commanded to write a treatise on the subject of the divorce. In 1530 he was sent abroad with others to collect the opinions of the divines and canonists of France, Italy, and Germany, on the validity of the king's marriage. At Rome he presented his treatise to the pope, and afterwards proceeded to Germany, where he obtained for his opinions the sanction of a great number of German divines and civilians, and formed such intimate connections with the rising party of the Protestants as probably influenced greatly his future conduct. In January, 1533, he was appointed Archbishop of Canterbury. Soon after, he set the Papal authority at defiance, by pronouncing sentence of divorce between Henry and Catharine, and confirming the king's marriage with Anne Boleyn. The pope threatened excommunication, and an act of Parliament was immediately passed for abolishing the pope's supremacy, and declaring the king chief head of the Church of England. The archbishop employed all his influence in forwarding such measures as might give permanence to the reformation. The Bible was translated into English, and dispersed among the people; the monastic institutions were suppressed; the superstitious observances connected with them were abolished; and provision was made for the instruction of all ranks in the principles of the prevailing party.

In 1536 the casuistry of Cranmer was a second time exerted to gratify the base passions of his tyrannical sovereign. When Anne Boleyn was destined to lose her reputation and her life, that the king might take another consort, it was determined also to bastardize her issue; and the archbishop meanly stooped to pronounce a sentence of divorce, on the plea that the queen had confessed to him her having been contracted to Lord Percy before her marriage with the king. The compliances of the primate served to insure him the gratitude of Henry, though he was obliged to make some important sacrifices to royal prejudice, which was strongly in favour of the ancient faith where that did not tend to curb the king's own passions or prerogatives. In 1539 was passed an act of Parliament, called the *bloody act*, condemning to death all who supported the right of marriage of priests, and communion of both kinds to the laity, and who opposed transubstantiation, auricular confession, vows of chastity, and the necessity of private masses. Cranmer opposed, as long as he dared, this enactment; but, finding his efforts vain, he gave way, and sent his own wife back to her friends in Germany. He subsequently succeeded in carrying some points in favour of further reformation.

On the death of Henry, in 1547, the archbishop was left one of the executors of his will, and member of the regency appointed to govern the kingdom during the minority of Edward VI. He united his interest with that of the Earl of Hertford, afterwards Duke of Somerset, and proceeded to model the Church of England according to the notions of Zuinglius, rather than those of Luther. By his instrumentality the liturgy was drawn up and established by act of Parliament, and articles of religion were compiled, the validity of which was enforced by royal authority, and for which infallibility was claimed. Under Cranmer's ecclesiastical government Joan Bocher and George van Paris were burned as heretics; and the fate of the former is rendered peculiarly striking by the fact that the primate, by his spiritual authority and pressing importunity, constrained the young king to sign the death-warrant for the *auto-da-fé* of the unhappy criminal, which he would not do till he had disburdened his own conscience, by telling the archbishop that, if the deed were sinful, he should answer for it to God. The exclusion of the Princess Mary from the crown, by the will of her brother, was a measure in which Cranmer joined the partisans of Lady Jane Grey, apparently in opposition to his own judgment. With others who had been most active in her elevation, he was sent to the Tower on the

accession of Mary. That princess had personal obligations to Cranmer, who is said to have preserved her from the anger of her father, which menaced her with destruction, for her pertinacious adherence to the Catholic faith; but she could not forget or forgive the disgrace of her mother and herself, in effecting which, the archbishop had been so important an agent; he was therefore destined to become the victim of Popish ascendency. He was tried before commissioners sent from Rome, on the charges of blasphemy, perjury, incontinence, and heresy, and cited to appear within eighty days at Rome, to deliver, in person, his vindication to the pope. To comply with this mandate was impossible, as he was detained in prison; nevertheless he was declared contumacious for not making his appearance, and sentenced to be degraded and deprived of office. After this, flattering promises were made, which induced him to sign a recantation of his alleged errors, and become, in fact, a Catholic convert. The triumph of his enemies was now complete, and nothing was wanting but the sacrifice of their abused and degraded victim. Oxford was the scene of his execution; but to make the tragedy more impressive, he was placed on a scaffold in St. Mary's Church, the day he was to suffer, there to listen to a declaration of his faults and heresies, his extorted penitence, and the necessity of his expiating, by his death, errors which Heaven alone could pardon, but which were of an enormity too portentous to be passed over by an earthly tribunal. Those who planned this proceeding accomplished but half their object. Instead of confessing the justness of his sentence, and submitting to it in silence, or imploring mercy, he calmly acknowledged that the fear of death had made him belie his conscience; and declared that nothing could afford him consolation but the prospect of extenuating his guilt by encountering, as a Protestant penitent, with firmness and resignation, the fiery torments which awaited him. He was immediately hurried to the stake, where he behaved with the resolution of a martyr, keeping his right hand, with which he had signed his recantation, extended in the flames, that it might be consumed before the rest of his body, exclaiming from time to time, 'That unworthy hand.' He was executed, March 21, 1556.

CRANNOGES. See LAKE DWELLINGS.

CRANTARA, the cross which formed the rallying symbol in the Highlands of Scotland on any sudden emergency. The Highlanders appear to have borrowed it from the ancient Scandinavians, of the use of it among whom, for rousing the people to arms, Olaus Magnus gives a particular account. As late as the insurrection in 1745 the *crantara*, or fiery cross, was circulated in Scotland, and on one occasion it passed through the district of Breadalbane, a tract of 32 miles, in three hours. After Charles Edward had marched into England, two of the king's frigates threatened the coast with a descent. The *crantara* was sent through the district of Appin by Alexander Stuart of Invernahyle (who related the circumstance to Sir Walter Scott), and in a few hours a sufficient force was collected to render the attempt of the English hopeless.

CRAPE, a light, transparent stuff, like gauze, made of raw silk, gummed and twisted on the mill, woven without crossing, and much used in mourning. Crapes are either craped (that is, crisped) or smooth. The silk destined for the first is more twisted than that for the second, it being the greater or less degree of twisting, especially of the warp, which produces the crisping given to it when taken out of the loom, steeped in clear water, and rubbed with a piece of wax for the purpose. Crapes are all dyed raw. This stuff came originally from Bologna; but till of late years Lyons is said to have had the chief manufacture of it. It is now manufactured in various parts of Great Britain. The crape brought from China is of a more substantial fabric.

CRAPELET, father and son, two printers.—The father, CHARLES, born at Levécourt in Haute Marne, November 13, 1762, established his printing-office in 1789, and died October 19, 1809. He might be called the *French Baskerville*. Like this printer he endeavoured to unite the greatest simplicity with elegance, to deliver the art of printing from the heterogeneous ornaments with which it was so overloaded, particularly in France, and from which even Didot could not entirely free himself; but he surpassed his model in the form of his types and the regularity of his work. His editions are no less correct than neat and beautiful. He was also successful in printing on parchment, and has shown his skill by producing an impression in gold (thirteen copies of Audebert's Oiseaux dorés, Paris, 1802, two vols. folio).—GEORGES ADRIEN, born at Paris in 1789, died in 1842, extended his father's business, and excelled him in elegance. His Lafontaine (1814), Montesquieu (1816), Rousseau and Voltaire (both 1829), are monuments of his taste; and the large vellum-paper copies are truly splendid works. The words *De l'imprimerie de Crapelet* are a great recommendation. Renouard caused all the editions published at his expense to be printed by Crapelet.

CRASHAW, RICHARD, an English poet, born in London, and educated at the Charterhouse and at Cambridge, where he graduated in 1633. In 1637 he became a fellow of Peterhouse, and having been admitted to orders, was noted as an eloquent and powerful preacher. He officiated in St. Mary's Church, near his college, and employed himself frequently in the composition of religious poems. In 1634 a volume of Latin poems, under the title of Epigrammata Sacra, had been published anonymously by him at Cambridge. In 1644 he was ejected from his fellowship by the Parliamentarians, and proceeded to Paris, where he became a convert to the Roman Catholic faith. Through the introduction of Cowley, then also an exile, he obtained from Henrietta Maria letters to various Italian dignitaries, and proceeded to Rome, where he was first secretary to a cardinal and afterwards a canon in the church of Loretto. He died in 1650. A collection of poems by him, entitled Steps to the Temple, Sacred Poems, with other Delights of the Muses, was published in London in 1646; and a posthumous volume appeared at Paris in 1652, under the title Carmen Deo Nostro. Crashaw displays considerable poetic genius in the treatment of religious subjects, though his works are now almost forgotten. Collected editions of them were published in 1670 and 1785; another, under the editorship of W. B. Turnbull, appeared in London in 1858. Dr. George Gilfillan has also published some of Crashaw's poems in his edition of British Poets; and an edition by Grosart was published in 1872.

CRASSUS, LUCIUS LICINIUS, a celebrated Roman orator, was born B.C. 140, passed for the greatest orator of his time, and died B.C. 91. After passing through the lower offices he obtained the consulship in B.C. 95. He was made censor in B.C. 92 along with L. Domitius Ahenobarbus. He was fond of luxury and magnificence, and had a splendid house and gardens, with fish-ponds and all the other appurtenances of a first-class Roman mansion. His colleague found fault with this extravagance, and publicly taunted him with crying at the death of a favourite lamprey—a tame fish which used to come at his call and feed from his hand. Crassus replied to this taunt by the retort that Ahenobarbus had not shown a

like amount of feeling at the death of any of his three wives. A passionate speech delivered by Crassus in the senate so shook his constitution that a fever was the result, of which he died.

CRASSUS, Marcus Licinius, the triumvir, surnamed *Dives* (the rich), on account of his vast riches, was born about B.C. 115. His father and brother suffered death for their resistance to Marius and Cinna (in B.C. 87), and he himself thought it prudent to retire to Spain, where he concealed himself in a cavern. When Sulla landed in Italy, B.C. 83, Crassus joined him and rendered him important services, for which he was rewarded with donations of confiscated property, besides being allowed to purchase confiscated estates at an almost nominal value. He was exceedingly fond of wealth, and also exceedingly skilful and by no means scrupulous in the ways and means of accumulating it. In B.C. 71 he was created prætor, and took the command against Spartacus and the revolted slaves. Spartacus was defeated and slain, along with a great number of his followers, and 6000 captured slaves were crucified along the road between Rome and Capua. In B.C. 70 he was elected consul, having Pompey as his colleague. To gain the favour of the populace he once gave an entertainment to the whole people, in which 10,000 tables were set, and besides this distributed corn enough to last each family three months. As he was one of the most influential men in Rome, and very ambitious, his friendship was sought by Cæsar, who formed with him and Pompey the first triumvirate in B.C. 60. The power of the triumvirs secured the re-election of Pompey and Crassus as consuls in B.C. 55, and according to the Trebonian law Syria and the two Spains were assigned to the consuls for five years, Gaul and Illyricum falling to Cæsar. Crassus obtained Syria as his province, and envious of the military glory that both Pompey and Cæsar had attained, now determined to rival them. Accordingly, without the sanction of the senate, and in violation of treaties, he proceeded to attack the Parthians, reckoning on an easy victory, and expecting to obtain enormous treasures. Josephus tells us that on this expedition he plundered the temple of Jerusalem, but the story is doubtful. His whole campaign was marked by a neglect of the necessary military arrangements, and allowing himself to be misled by a crafty Arab chief, he was taken at a disadvantage on the open plains of Mesopotamia by Surenas, the general of the Parthian king Orodes, and perished with his son and a large portion of his troops, B.C. 53. His head was sent to Orodes, who caused melted gold to be poured into the mouth, in scorn of the greed of Crassus.

CRATER. See Volcanoes.

CRATER. One of Ptolemy's northern constellations. It is sometimes considered a part of the constellation Hydra.

CRAVAT, an article of European dress. The ancients left the neck unconfined. In some cases, indeed, they defended themselves from the cold by a woollen, cotton, or silk band, called in Latin *focale*, from *fauces*, throat. But no one could venture to use this article of dress publicly unless he was sick, in which case he might cover his head and the upper part of his shoulders, and even wear breeches without disgrace. '*Palliolum, sicut fascias et focalia,*' says Quinctilian, '*sola excusare potest valetudo.*' It was allowable, indeed, to cover the neck with the *toga* in bad weather, or to hold the hand over it, for the preservation or restoration of the natural temperature. The bare neck gradually became unfashionable in Europe. It was at first surrounded, but not constrained, by a starched band of fine linen on the upper edge of the shirt, falling back naturally upon the bust, where it was fastened by a small cord. This was the origin of all the different species of collars since used—the innocent parent of those thick, hot folds in which the neck was destined to be afterwards muffled. Ruffs, stiffened or plaited, single or in many rows—an inconvenient, indeed, but not a dangerous ornament—had their turn, and lasted as long as short hair was in fashion. They were abandoned when Louis XIII. allowed his hair to grow: then standing collars, embroidered and pinked, the plaited collarettes, the neck-band, plain or laced and pointed, encompassed the neck chin-deep; and when Louis XIV. adopted those enormous periwigs, which hardly left the throat visible, all these splendid envelopes gave way to ribands, tied in brilliant bows. Next came the epoch of the dangerous subjection of the neck to constriction and compression from which it had hitherto been exempt.

In 1660 a foreign regiment arrived in France, composed of Croats, in whose singular costume one thing was generally admired and imitated. It was a bandage about the neck, consisting of common stuff for the soldiers, and of muslin or silk for the officers. The ends were disposed in a bow, or garnished with a tuft or a tassel, and hung not ungracefully over the breast. This new article of dress was at first called a *croate*, and afterwards by corruption a *cravat*. The military and the rich at that time wore very fine cravats, with the border embroidered or edged with broad lace. Those of the soldiers consisted of a scrap of cloth, of cotton, or, at the best, of black, plaited taffeta, bound round the neck by two small cords. Afterwards the place of these cords was supplied by clasps or a buckle, and then cravats took the name of *stocks*. Under Louis XVI. the stocks yielded to the cravats *à la chancelière*. The last flourished but for a moment: the revolution came, and with it disappeared cravats and even tight breeches.

Soon after this epoch (1796) the cravat recovered its popularity, and increased to an incredible degree of extravagance. Some persons enveloped the neck with whole pieces of muslin; others with a padded cushion, on which were wrapped numerous folds. In this way the neck was puffed out so as to be larger than the head, with which it was imperceptibly confounded. The shirt-collar arose above the ears, and the upper edge of the cravat buried up the chin and the mouth nose-deep; so that the visage, bristling on either side with a grove of bushy whiskers, and its upper regions ensconced to the eyes by the hair flattened down over the brows, absolutely showed nothing except the nose, projecting in all its plenitude. The exquisites thus cravatted resembled anything rather than men, and afforded excellent subjects for caricatures. If they wished to look any way except straight forward they were obliged to turn the whole trunk, with which the neck and head formed but one piece. It was impossible to incline the head in any direction. This fashion of wearing voluminous cravats lasted for a considerable time, but common sense at last brought in the simpler style of neckties that has since prevailed.

CRAWFISH (*Astacus*, Fab.), a genus of Crustaceans belonging to the family Decapoda Macroura (ten-legged, long-tailed), characterized by having the anterior part of the elongated semi-cylindric carapace produced anteriorly to form a rostrum or beak, while the fifth or last ring is movably articulated; the abdomen large, slightly attenuated posteriorly, composed of six joints, forming a tail quite as long, when extended, as the body, and terminating in five broad-fringed, swimming appendages, which fold laterally upon each other. In both sexes the under part of the abdomen is generally provided with five pairs

of imperfectly developed limbs, each terminated by two plates or plaments. The exterior jaw-feet are mostly narrow, elongated, and do not entirely cover the other parts of the mouth. The gills are pyramidal, brush-shaped, or plume-like, separated from each other by tendinous slips, and situated beneath the sides of the great superior shell, over the external base of the feet. Of the latter the second and third pairs are elongated, slender, and furnished at the last joint, which is movable, with small pincers; the fourth and fifth pairs have the last joints simply pointed or hooked. The sexual organs are placed in both sexes in the basal joint of the last pair of feet. The genus is now restricted to the fresh-water forms, the marine lobsters being referred to the genera *Homarus* and *Nephrops*. In their modes of living the crawfish generally resemble the aquatic crabs (see CRAB), feeding on putrefying animal matter, spending their time on the sandy or rocky bottom of deep waters, and only approaching the shallows when impelled by the necessity of undergoing their change of shell, or when under the sexual influence.

The common crawfish (*Astacus fluviatilis*) greatly resembles the lobster both in appearance and habits. It inhabits the fresh waters of Europe and the north of Asia, and is common in some of the streams of England. It lurks under stones or in holes in the banks, which have either been excavated by the inhabitant or are the deserted burrow of a water-vole. Its food consists of small molluscs or fishes, the larvæ of insects, and almost any sort of animal matter. They grasp their prey with their claws, which they also employ as weapons of defence. The female lays a great number of eggs, which are attached to thread-like appendages under the tail, and remain there till the young are hatched. These are similar to their parents in every respect, but being at first soft and liable to injury, they are for some days protected by the tail of the mother, until they are strong and hardy enough to take care of themselves. The colour of the crawfish is greenish-brown, which becomes a deep red by boiling. There are various methods of catching crawfish. One method is by pots or creels of wicker-work, so constructed that the animal can enter to get at the bait, but is unable to get out again. Another method is by a circular net fastened to an iron hoop, and provided with a piece of meat tied inside it in the centre as a bait. It is upon these fresh-water species especially that the observations have been made relative to the reproduction of limbs or claws violently broken off. A new limb, similar to the original, though sometimes rather smaller, is soon formed, and this takes place also after the animal has voluntarily thrown off an injured member. This facility of reproduction is found to extend throughout the crustaceous class. Crawfish are regarded by many as furnishing a delicate dish for the table, though their small size, and the trouble of collecting a sufficient nuumber of them, are great obstacles to their being extensively employed in this way. They are preyed upon by various animals, especially by certain birds, whose long bills are adapted to picking them out from the bottom of their dens.

CRAYER, GASPAR, a Dutch painter, born in 1582, at Antwerp, was a pupil of Raphael Coxis, and became, by the study of nature, one of the greatest historical and portrait painters. At the Spanish court in Brussels he painted the portrait of the Cardinal Ferdinand, brother of the king, and received a pension. He established himself in Ghent, where he constantly executed works for the court. He laboured with industry and perseverance till his eighty-sixth year. When Rubens saw his finest painting in the refectory of the abbey of Affleghem he cried out, 'Crayer, Crayer, nobody will ever surpass thee!' The city of Ghent alone had twenty-one altar-pieces by him. In Flanders and Brabant are many of his works, and some of his pictures are in the public collections at Vienna and Munich. His paintings are praised for fidelity to nature, excellent drawing, and a colouring approaching the manner of Vandyke. The latter was his friend, and took his likeness. Crayer died in 1669.

CRAYONS, a general name for all coloured stones, earths, or other minerals and substances used in designing or painting in pastel, whether they have been beaten and reduced to a paste, or are used in their primitive consistence after being sawn or cut into long, narrow slips. *Crayon painting* is practised by rubbing on dry colours in the manner of chalk-drawing, on grounds properly prepared. Vellum or paper is to be employed to receive the colours. The vellum or paper is to be pasted upon canvas extended on a proper stretching frame. A mixture of powdered pumice-stone and whitening, or prepared chalk, with the addition of some thin size or glue, is then to be laid over the surface of the paper or vellum with a common paste-brush, and this is to be repeated twice; when dry it must be well rubbed with a piece of flat pumice-stone, to render it even and smooth. The best crayons are made in Switzerland or Paris, and are to be had at all the colour shops, ready and arranged in sets. The design being sketched in with pipe-clay, or soft willow charcoal, the crayon is to be laid on in a good full body, in the manner of chalk, and then rubbed in and made smooth with the *stump*, a cylindrical roll of fine leather, chamois or sheep-skin, cut to a point at both ends. Whatever be the form or surface to be filled, it is best to begin with the middle tint; and in painting flesh the gray tones should precede the warm. As crayons differ much in their degrees of hardness, arising from the nature of the colours composing them, particularly those made from lakes and blues, it may be found necessary occasionally to moisten with spirits of wine such as are found to be very hard and unmanageable, and if too soft, they should be broken down and ground up again with the addition of a little skimmed milk. The chief benefit gained in adopting this method of drawing (or painting, as it is sometimes called) consists in the great facility of its execution, and the soft beauty of effects so easily produced; but the drawings must be preserved constantly under glass, a little rude handling being sufficient to destroy them. The paper now generally, if not exclusively, used for this kind of drawing is thickish and hard, with a granulated surface of various tints; it is sold in the shops under the name of crayon paper.

CREAM, the yellowish, thick, oily layer which forms at the surface when new milk in a flat dish is allowed to remain at rest in a cool airy place. Its average specific gravity is about 1·025; it is insoluble in water, but dissolves almost completely in ether and alcohol, and in alkalies, which saponify it. Its most important ingredient is a mixture of fats inclosed in albuminous sacks, and forming minute globules not larger than $\frac{1}{3000}$th of an inch, and these being lighter than the milk, float up to the surface, bringing with them much serum and a little casein. When cream is agitated or churned the little sacks are burst, the fat-globules coagulate, forming butter, and the serum separates as butter-milk. Butter, however, unless very thoroughly washed, always contains a certain proportion of the serum and casein, the presence of which is the cause of its becoming rancid. When cream is exposed to the air it gradually thickens; in a week or ten days it becomes mouldy on the surface, loses its oily taste, and becomes caseous. This is one way of making cream-cheese.

CREAM OF TARTAR (*potassæ supertartras; cremor tartari*). This salt exists in grapes, in tamarinds, and in other fruits. The dregs of wine also contain a considerable quantity of it. Cream of tartar consists chiefly of bitartrate of potassium, about seven or eight hundredths of tartrate of calcium, and a small quantity of silica, albumen, iron, &c., but the quality varies. It is a white crystalline powder, insoluble in alcohol, but it may be dissolved in fifteen parts of boiling and sixty of cold water. It may be rendered much more soluble by mixing with it a certain quantity of boracic acid or borate of sodium, which renders the cream of tartar soluble in its own weight of cold water, and in the half only of that menstruum when boiling. This preparation is known by the name of *soluble cream of tartar*. Cream of tartar is manufactured by dissolving in boiling water the common tartar or argal (which see)—a white or reddish crystalline matter which deposits in the vessels in which wine has been kept—mixing with it some clay, which precipitates the colouring matter, and then permitting the liquor to crystallize. As the solution cools, a crust forms on the surface which may be skimmed off. It was to this the name 'cream of tartar' was originally applied. The action of this salt varies according to the dose in which it is administered. In small doses it is absorbed, and acts as a temperant; and in this quality it is employed in jaundice, foulness of the stomach and intestines, &c. In larger doses it principally spends its action on the mucous intestinal membrane, and induces alvine evacuations, especially when given in powder. Its taste being rather less unpleasant than that of some other neutral salts used in medicine, and its operation being of a very gentle nature, it is very frequently administered. In France the soluble cream of tartar is generally preferred. Cream of tartar is used in calico-printing and in dyeing, but crude argal is more commonly employed. See TARTARIC ACID.

CREASOTE. See KREASOTE.

CREATINE, or KREATINE ($C_4H_9N_3O_2,H_2O$), was discovered by Chevreul in 1835. Other chemists tried to obtain it, but unsuccessfully, until Liebig, in 1847, described the precautions requisite for its preparation. Since then it has been repeatedly examined, and a number of methods proposed for getting it from different substances. It is contained in the fluid of the striped and smooth muscle of all classes of animals, from which it is always prepared, in the blood, in the brain, and in other parts. But though a constant, it is not an abundant constituent of flesh, for that of poultry, in which the largest proportion is met with, only contains 0·35 per cent., and the flesh of most other animals seldom more than two or three hundredths. To obtain it the flesh, as free from fat as possible, is exhausted with water and pressed, the extract heated to coagulate albumen, filtered, the filtrate precipitated with lead; and the fluid from this, after being freed from excess of lead, concentrated, when the creatine crystallizes on cooling. If necessary the crystals are redissolved, decolorized, and crystallized over again. A very good material from which to obtain creatine is Liebig's extract of meat, which only requires the above treatment from the precipitation with lead to yield it in considerable quantity. Pure creatine forms transparent, colourless, highly lustrous monoclinic crystals. They contain water of crystallization, which is easily expelled at 212°, and then they become white and opaque. Creatine is readily soluble in water and in dilute spirit, but the stronger the spirit the less creatine dissolves. It is insoluble in ether. Its solutions are neutral; they have a bitter scratching taste, and readily mould. It acts as a feeble base, combining with acids to form crystallizable salts. It undergoes various decompositions with chemical reagents, the most important of which results from the action of the strong mineral acids. When heated with sulphuric acid, for instance, it loses water, and is converted into a substance called creatinine, $C_4H_7N_3O$. This body was first distinguished by Liebig in the course of his investigations into creatine. It is obtained from the fluid from which creatine has been separated, but the best source of it is the urine of man and other mammalia. From this source it is got by removing the inorganic salts, and adding chloride of zinc to the liquid. Crystals of a zinc compound of creatine and creatinine deposit on standing, which is afterwards decomposed, and the creatinine dissolved out by strong alcohol. When pure it forms colourless monoclinic prisms readily soluble in water; soluble also in strong alcohol, but hardly in ether. It is a strong base; in solution it has an alkaline reaction and ammoniacal taste, and combines with the acids to form stable crystallizable salts. It yields a number of products, and can be reconverted into creatine by heating with an alkali. With regard to the origin and significance of these two bodies in the animal economy, it seems correct to assume, from the parts in which they are found, that they are both decomposition products of muscle, and represent so much tissue-waste, but that creatine is the first stage, and creatinine the second. Indeed it has been shown that, with proper precautions, creatine quite free from creatinine can be obtained from flesh, so that when creatinine is also obtained it is due probably to decomposition of part of the creatine. It is probable also that urea is a further decomposition product of creatine, but the connection between them has not yet been fully demonstrated.

CRÉBILLON, CLAUDE PROSPER JOLYOT DE, the younger son of Prosper Jolyot de Crébillon, was born at Paris in 1707, and succeeded as an author in an age of licentiousness. By the exhibition of gross ideas, covered only with a thin veil, and by the subtleties with which he excuses licentious principles, Crébillon contributed to diffuse a general corruption of manners, before confined to the higher circles of Parisian society. His own morals, however, appear to have been the opposite of those which he portrayed. We are told of his cheerfulness, his rectitude of principle, and his blameless life. In the circle of the *Dominicaux* (a Sunday society) he was a favourite, and the *caveau* where Piron, Gallet, Collé wrote their songs and uttered their jests was made respectable by his company. Of his works the best are, Lettres de la Marquise * * * au Comte de * * * (1732, two volumes, 12mo); Tanzai et Néadarné (less licentious, but full of now unintelligible allusions); Les Égaremens du Cœur et de l'Esprit (Hague, 1736, three volumes), perhaps the most successful, but unfinished. One of his most voluptuous pieces is Le Sopha (1745, two volumes). In the same licentious strain are most of his other writings composed. It is still a disputed point whether he was the author of the Lettres de la Marquise de Pompadour. They are not included in the edition of 1779, seven volumes, 12mo. Crébillon held a small office in the censorship of the press. He died at Paris, April 12, 1777.

CRÉBILLON, PROSPER JOLYOT DE, the elder, a French writer of tragedy, who is compared by his countrymen even to Æschylus, was born at Dijon, Feb. 15, 1674, and early manifested talent at the school of the Jesuits in his native town, but at the same time a boisterous and heedless temper. Being designed for the profession of law, he was placed with an attorney, named Prieur, at Paris; but they were both lovers of the theatre, so that the youth made little progress in his studies. The attorney

perceived, too, that his pupil was disqualified for the profession by his passionate temperament, but showed penetration and judgment in his criticisms on dramatic performances; he therefore advised him, though he had as yet written nothing but some trifling songs and scraps of verse, to apply himself to dramatic composition. Crébillon did so; but his first piece, La Mort des Enfans de Brutus, was rejected by the players. He burned the manuscript, and resolved to have no more to do with the drama; but subsequently, at the persuasion of Prieur, he wrote Idoménée, which, in 1705, was brought upon the stage. The faults of the play were overlooked in consideration of the youth of the author and the promising talent which it displayed; and the promptness with which the author in five days wrote anew the last act, which had displeased at the first representation, drew the attention of the public to the young poet, whose talents, after the appearance of his Atrée, in 1707, were loudly applauded. Prieur, though sick, requested to be carried to the theatre, and said to the young tragedian, 'I die content; I have made you a poet, and leave in you a man who belongs to the nation.' A strange taste for unnatural declamation had been excited by the Rhodogune, and this manner was carried to excess by Crébillon in the Atrée. In 1709 appeared his Electre, which is as declamatory and as intricate as his earlier plays; yet it suited the taste of the age. His *chef-d'œuvre*, at at least according to La Harpe, is his Rhadamiste (1711). But Boileau on his death-bed, hearing the first scenes of this tragedy read to him by Leverrier, could not help exclaiming to his friends, 'Heavens! do you wish to hasten my death? Why, the Boyers and Pradons were suns to this author! I shall be more willing to leave the world, since our age is becoming inundated with silly trash.' Most persons of the present day would probably agree with Boileau. In eight days the Rhadamiste passed through two editions, and Paris and Versailles vied with each other in admiring it. Crébillon had been told that his talent lay in the terrible, and thought, therefore, that he could not exert himself too much in scenes of horror, and hence was called the *Terrible*. Xerxes (1714) exceeded in this respect all that he had before written, but soon disappeared from the stage. Semiramis (1717), the mother enamoured of her son, and not cured of her passion by the discovery of his relationship, was severely censured. It was not till nine years after this that his Pyrrhus appeared (1726), and met with a good reception, contrary to the expectation of the author, who, in this work, had abstained from the frightful and shocking.

Domestic distress and poverty seem from this time to have crippled the powers of his genius. His small patrimony was absorbed by debts and law expenses. A father and a beloved wife were taken from him within a short time. Amidst the embarrassments in which he was involved he refused, with characteristic inflexibility, all the offers of assistance which were made him. When Madame de Pompadour wished to humble Voltaire, Crébillon was thought of as a fit instrument for her purpose. The king gave him the office of censor of the police, a yearly pension of 1000 francs, and an appointment in the library. Thus freed from anxiety, he finished his Catiline, which was represented, at the king's expense, in 1749, with all the pomp that the court theatre could display. This piece, overrated by the party opposed to Voltaire, is undervalued by La Harpe. To make some atonement to the character of Cicero, which was thought to have been wronged in his Catiline, he wrote, at seventy-six, the Triumvirate, or the Death of Cicero, which was brought upon the stage in his eighty-first year. The defects of this piece were overlooked, from respect to the age of the author. Thus much for his dramatic compositions. In general Crébillon shows none of the true elevation of the tragic art, but only an imitation, sometimes a happy one, of the manner struck out by Corneille. He was a man of a proud and independent character, disdained to flatter the great, and passed much of his life in a condition bordering on poverty. More fortunate circumstances might have given more amenity to his spirit; but neglected, as he imagined, by mankind, he sought consolation in the company of dogs and cats, which he picked up in the streets (the poorest and most sickly were those which he preferred), and found a species of enjoyment in an irregular manner of living. In 1731 he became a member of the Academy. Crébillon died June 17, 1762, at the age of eighty-eight. Besides the splendid edition of Crébillon's works published by the order of Louis XV. for the benefit of the author, after the successful performance of Catiline (Œuvres de Crébillon, imprimerie R. du Louvre, 1750, two vols. 4to), we should mention the editions of Didot the elder (1812, three vols., and 1818) and of Perelle (Paris, 1828).

CRECY, or Cressy, a small town of France, in the department of Somme, 9 miles north of Abbeville, and 100 north of Paris; pop. 1748. It is celebrated on account of a battle fought here, August 26, 1346, between the English and French. Edward III. and his son, the Black Prince, were both engaged, and the French were defeated with great slaughter, 30,000 foot and 1200 horse being left dead on the field; among whom were the King of Bohemia, the Count of Alençon, Louis, count of Flanders, with many others of the French nobility.

CREDIT, in economy, is the postponement agreed on by the parties of the payment of a debt to a future day. It implies confidence of the creditor in the debtor; and a 'credit system' is one of general confidence of people in each other's honesty, solvency, and resources. Credit is not confined to civilized countries, but it will not prevail extensively where the laws do not protect property and enforce the fulfilment of promises. Public credit is founded upon a confidence in the resources, good faith, and stability of the government; and it does not always flourish or decline at the same time and rate as private credit; for the people may have either greater or less confidence in the government than in each other. Still there is some sympathy and correspondence between the two; for a general individual confidence can rarely, if ever, take place in the midst of distrust of the government; and, *vice versâ*, a firm reliance upon the government promotes a corresponding individual confidence among the citizens. The history of every industrious and commercial community, under a stable government, will present successive alternate periods of credit and distrust, following each other with a good deal of regularity. A general feeling of prosperity produces extension and facilities of credit. The mere opinion or imagination of a prevailing success has, of its own force, a most powerful influence in exciting the enterprise and quickening the industry of a community.

The first requisite to industry is a stock of instruments, and of materials on which to employ them. A very busy and productive community requires a great stock of both. Now if this stock, being ever so great, were hoarded up; if the possessors would neither use, let, nor sell it as long as it should be so withdrawn from circulation, it would have no effect upon the general activity and productiveness. This is partially the case when a general distrust and impression of decay and decline cause the possessors of the stock and materials to be scrupulous about

putting them out of their hands, by sale or otherwise, to be used by others; and others, again, having no confidence in the markets, and seeing no prospect of profits, hesitate to purchase materials, or to buy or hire the implements, mills, ships, &c., of others, or to use their own in the processes of production and transportation. This state of surplusage and distrust is sure to be followed by a reduction of money prices; and everyone who has a stock on hand, and whose possessions are estimated in money, is considered to be growing poorer and poorer every day. But when prices have reached their lowest point, and begin regularly to rise, everybody begins to esteem himself and others as being prosperous, and the opinion contributes powerfully to verify itself. Credit begins to expand; all the stores of the community are unlocked, and the whole of its resources is thrown open to enterprise. Everyone is able readily to command a sufficiency of means for the employment of his industry; capital is easily procured, and services are readily rendered, each one relying upon the success of the others, and their readiness to meet their engagements; and the acceleration of industry, and the extension of credit, go on until a surplus and stagnation are again produced.

The affairs of every industrious and active community are always revolving in this circle, in traversing which general credit passes through its periodical ebbs and flows. This facility and extension of credit constitute what is commonly called *fictitious capital.* The fiction consists in many individuals being supposed to be possessed of a greater amount of clear capital than they are actually worth. The most striking instance of this fictitiousness of capital, or, in other words, excess of credit, appears in the immense amounts of negotiable paper that some individuals and companies spread in the community, or of paper currency, where the issuing of notes for supplying currency by companies or individuals is permitted. Individuals or companies thus draw into their hands an immense capital, and it is by no means a fictitious capital when it comes into their possession, but actual money, goods, lands, &c.; but if they are in a bad losing business, the capital, as soon as they are intrusted with it, becomes fictitious in respect to those who trusted them with it, since they will not again realize it. Extensive credits, both in sales and the issuing of paper, in new and growing communities which have a small stock and great industry, grow out of their necessities, and thus become habitual and customary, of which America hitherto has given a striking example.

CREDITON, a town of England, in Devonshire, near the Creedy, 8 miles N.W. of Exeter. It is about 1 mile in length, formed chiefly of one broad street, between two hills, and consists of two parts, the east and west towns, the latter of which was twice destroyed by fire in the last century. It has a church, in the later pointed style, with a noble tower rising from the intersection of the nave; several Dissenting chapels, and numerous schools, including the free grammar-school founded by Edward VI. There are flour-mills, a lozenge manufactory, and a tannery, and large quantities of cider are made. Pop. 4222.

CREECH, THOMAS, a scholar of some eminence for his classical translations, was born in 1659. He took the degree of M.A. at Oxford in 1683, having the preceding year established his reputation as a scholar by printing his translation of Lucretius. He also translated several other of the ancient poets, wholly or in part, comprising selections from Homer and Virgil, nearly the whole of Horace, the thirteenth satire of Juvenal, the Idyls of Theocritus, and several of Plutarch's Lives. He likewise published an edition of Lucretius in the original, with interpretations and annotations. He put an end to his life at Oxford in 1701. Various causes are assigned for this rash act, but they are purely conjectural. He owes his fame almost exclusively to his translation of Lucretius, the poetical merit of which is not very great, although, in the versification of the argumentative and mechanical parts, considerable skill is exhibited. As an editor of Lucretius, he is chiefly valuable for his explanation of the Epicurean philosophy, for which, however, he was largely indebted to Gassendi.

CREED, a summary of belief, from the Latin *credo* (I believe), with which the Apostles' Creed begins. In the Eastern Church, a summary of this sort was called *mathēma* (the lesson), because it was learned by the catechumens; *graphē* (the writing), or *kanōn* (the rule). But the most common name in the Greek Church was *sumbolon* (the symbol), which has also passed into the Western Church. Numerous ancient formularies of faith are preserved in the writings of the early fathers, Irenæus, Origen, Tertullian, &c., which agree in substance, though with some diversity of expression. The history of creeds would be the history of the church, and of its melancholy aberrations from the simple doctrines of Jesus. Into this interesting but humiliating history we cannot now enter, but must confine ourselves to a rapid view of a few of its most prominent features. Of the earlier creeds, there are three which require particular attention.

I. The *Apostles' Creed* is so called from its having been formerly considered as the work of the apostles themselves. This notion is now acknowledged to be without foundation. When and by whom it was drawn up is not known. It can only be traced to the fourth century. It contains a profession of belief in the Holy Ghost, in the divinity of Jesus, his descent into hell, and his ascension into heaven, in the resurrection of the body, in life everlasting, &c.

II. The *Nicene Creed,* so called because it was adopted at the Council of Nice, A.D. 325, held to oppose the Arian heresy. It therefore contains an explanation of the article of the Apostles' Creed—'I believe in Jesus Christ, the only Son,' &c., which is as follows: 'The only Son of God, begotten of his Father before all worlds, God of God, light of light, very God of very God, begotten, not made, being of one substance with the Father by whom all things were made.' Macedonius, bishop of Constantinople, having denied the divinity of the Holy Ghost, it became necessary to settle this point, which was done by the Council of Constantinople, A.D. 381, who added the words which follow—'I believe in the Holy Ghost;' namely, 'the Lord and Giver of life, who proceedeth from the Father ('and the Son' was afterwards inserted by the Spanish bishops), who, with the Father and the Son together, is worshipped and glorified, who spake by the prophets.' The insertion of the words 'and the Son' was finally sanctioned by the Roman Church in 883, but has never been received by the Greek Church.

III. The *Athanasian Creed* is now acknowledged not to have been the work of Athanasius, whose name it bears. It was probably written in Latin in the sixth century. In the tenth century it was generally received in the Western Church and at the Reformation was adopted by the Protestants. It consists of an introduction and two positions, with their proofs, deductions, and conclusions. The introduction declares, that 'whosoever will be saved must hold the Catholic faith.' The first position then states, 'The Catholic faith is this—that we worship one God in Trinity, and Trinity in Unity, neither confounding the persons nor dividing the substance.' For (to give briefly the remainder of this position) there are

three persons, but one Godhead. The Father, Son, and Holy Ghost are uncreate, incomprehensible, eternal, almighty, God, Lord; yet there are not three Lords, Gods, almighty, eternal, incomprehensible, uncreated, but one. The Father is neither made, created, nor begotten: the Son is of the Father alone, not made, nor created, but begotten. The Holy Ghost is of the Father and the Son, neither made, nor created, nor begotten, but proceeding; and in this Trinity none is afore or after another; none is greater or less than another. He, therefore, that will be saved must thus think of the Trinity. The second position establishes the doctrine of Christ's incarnation. It is necessary to everlasting salvation that we believe rightly in the incarnation of our Lord Jesus Christ. The right faith is, that he is the Son of God, God and man; perfect God and perfect man; yet not two, but one Christ; one, not by conversion of the Godhead into flesh, but by taking of the manhood into God; one altogether, not by confusion of substance, but by unity of person. This is the Catholic faith, which, except a man believe, he cannot, according to it, be saved.

Besides these creeds, there are numerous Confessions of Faith which have been adopted by different churches, as standards to which the ministers in the respective communions are required to conform.

I. The Greek Church presented the *Confession of the True and Sincere Faith* to Mohammed II. in 1453; but in 1643 the *Orthodox Confession of the Catholic and Apostolic Greek Church*, composed by Mogila, metropolitan of Kiew, was approved with great solemnity by the patriarchs of Constantinople, Alexandria, Antioch, and Jerusalem, and for a long time was the standard of the principles of the Russian Greek Church: it has been superseded by the Summary of Christian Divinity, composed in 1765 by the metropolitan of Moscow (translated into English, Edinburgh, 1814).

II. The Church of Rome has always received the Apostles', the Nicene, and the Athanasian Creeds: but a public authoritative symbol was first fixed by the Council of Trent. A summary of the doctrines contained in the canons of that council is given in the creed published by Pius IV. (1564), in the form of a bull. It is introduced by the Nicene Creed, to which it adds twelve articles, containing those doctrines which the Church of Rome finally adopted after her controversies with reformers.

III. The Lutherans call their standard books of faith and discipline Libri Symbolici Ecclesiæ Evangelicæ (Symbolical Books of the Evangelical Church). They contain the three creeds above mentioned, the Augsburg Confession, the Apology for that Confession by Melanchthon, the Articles of Schmalkalden, drawn up by Luther, the Catechisms of Luther, and, in many churches, the Form of Concord or Book of Torgau. The Saxon (composed by Melanchthon), Würtemberg, Suabian, Pomeranian, Mansfeldtian, and Copenhagen Confessions, agree in general with the symbolical books of the Lutherans, but are of authority only in the countries from which they are respectively called.

IV. The confessions of the Calvinistic churches are numerous. The following are the principal:—1. The Helvetic Confessions are three—that of Basel (1530); the Summary and Confession of Faith of the Helvetic Churches (Basel, 1536); and the Expositio simplex, &c. (1566), attributed to Bullinger. 2. The Tetrapolitan Confession (Strasburg, 1531), which derives its name from the four cities of Strasburg, Constance, Memmingen, and Lindau, by the deputies of which it was signed, is attributed to Bucer. It differs from the symbolical books of the Lutherans in the doctrine of the sacraments, and especially in its exposition of the eucharist. 3. The Palatine or Heidelberg Confession was framed at Heidelberg by order of the elector palatine, John Casimir (1575). 4. The Confession of the Gallic churches was accepted at the first synod held by the reformed at Paris in 1559. In the following year it was presented to Francis II., and in 1561 it was presented by Beza to Charles IX. 5. The Confession of the Reformed churches in Belgium was drawn up in 1559, and approved in 1561. 6. The Confession of Faith of the Kirk of Scotland. The ecclesiastical discipline and doctrine of the church of Geneva were adopted in Scotland, from the beginning of the reformation there. In 1581 the Scottish nation subscribed a General Confession, together with a Solemn League and Covenant, to defend the Protestant religion and Presbyterian government. The Scottish Covenanters afterwards adopted the Westminster Confession, in the compilation of which some delegates from their General Assembly had assisted. In 1688 that Confession was received as the standard of the national faith, which all ministers, and the officers of the Scottish universities, are required to subscribe. With this are generally connected the catechisms of their Assembly. 7. Confession of Faith of the Anglican Church. In the beginning of the reign of Queen Elizabeth she gave her assent to thirty-nine articles agreed upon in the Convocation held at London in 1552. They were drawn up in Latin; but in 1571 they were revised and subscribed both in Latin and English. They were adopted by the Episcopal Church in the United States of America in 1801, with some alterations, and the rejection of the Athanasian Creed. The first five contain the doctrines of the Anglican Church concerning the Father, Son, and Holy Ghost; in the sixth, seventh, and eighth, the rule of faith is established; the next ten relate to Christians as individuals, and the remaining twenty-one relate to them as members of a religious society. (See Corpus et Syntagma Confessionum Fidei, Geneva, 1612 and 1654; Sylloge Confessionum, Oxford, 1804; Butler's Account of Confessions of Faith.)

CREEKS, or Muscogees, Indians formerly in Georgia and Alabama, in the country watered by the Chatahoochee, Tallapoosa, and Coosa. They are now planted in the Indian Territory, in a fine district on the northern side of the Canadian River. The number of warriors used to amount to about 6000, but altogether the tribe does not now exceed 15,000. They suffered severely in 1813 and 1814 in the war with the United States. They have made considerable progress in agriculture, and raise horses, cattle, fowls, and hogs, and cultivate tobacco, rice, and corn.

CREEPERS. The many genera included under this designation make up the family *Certhiidæ*, which strongly resemble the woodpeckers in their habit of creeping on the stems of trees with the aid of the strong quills which project from the tail-feathers, and of securing their food by an exsertile tongue. The common creeper (*Certhia familiaris*, L.) is European, but is represented by American species. The slender bill is as long as the head, and slightly curved: the hind toe is longer than the middle one. The wall-creeper (*Tichodroma muraria*) of Southern Europe searches for its insect food on rocks. The nut-hatch (*Sitta europæa*) has a straight bill like that of the *Tichodroma*: though rapid in its movements on the trunks of trees, it derives no aid from the tail, which wants the projecting quills. Its trivial name is given to it because the nuts which it adds to its insect food are broken with violence and noise. The family is found in all parts of the world, the Polynesian Islands possessing, in the *Orthonyx*, a very close ana-

logue to the woodpeckers, while the Brazilian *Dendrocolaptes* resembles not merely in its greatly-curved bill, but also in the arrangement and colour of its feathers, the smaller humming-birds among which it lives.

CREFELD. See KREFELD.

CRELL, LORENZ FLORENZ FRIEDRICH VON, whose name is so familiar in the history of chemical literature, was born at Helmstädt, Jan. 21, 1744. He was a councillor of mines, and was successively professor of chemistry at the Collegium Carolinum, in Brunswick, from 1771 to 1773; of philosophy and medicine at Helmstädt University, till 1810; and of chemistry at Göttingen, where he died, June 7, 1816. He published a large number of investigations, as upon putrefaction, the growth of plants in pure water, boracic acid, phosphoric acid, &c.; but he is best known by his periodicals devoted to the recording of chemical discoveries, by his translations from French and other journals, and by those of the works of Kirwan, of Blagden, of Crawford, of Dobson, and of Black, whose pupil he was, and with whom he kept up a long correspondence. These periodicals amount to between sixty and seventy volumes, and are valuable for the early period of modern chemistry. Crell himself, however, never was a convert to the antiphlogistic theory.

CREMA, a city, Kingdom of Italy, Lombardy, province Cremona, in a beautiful plain on the left bank of the Serio, 25 miles E.S.E. of Milan; pop. 9200. It was founded by Lombards, and was destroyed in 1160 by Frederick I., for taking part with the Guelfs. It was taken by the French in 1797. It was soon rebuilt; and is now a well-built town, inclosed by a brick wall and a ditch, and containing an old castle, a cathedral, a picture-gallery, gymnasium, &c. It has manufactures of silk goods, hats, lace, and linen; and a considerable trade in wax, fish, honey, &c.

CREMNITZ. See KREMNITZ.

CREMONA, a city, Kingdom of Italy, capital of province of same name, on a plain on the left bank of the Po, 47 miles S.E. by E. Milan, and 26 miles N.W. Parma; it is regularly built, but extremely dull, and contains few objects of interest. It is surrounded by walls and wet ditches, and defended by a citadel, and is connected with the opposite bank of the river by a bridge, defended by a fort. The most remarkable edifice is the cathedral, begun in 1107 and completed about 1491. It exhibits little harmony of parts, but has a venerable and imposing appearance, and its interior decorations are of the most costly description. Close by, and connected with the cathedral, is the Torazzo, the loftiest and most beautiful tower in Italy; it is built of brick, 372 feet high, having 490 steps to the bell-story. There are other forty-five churches, but none of them are remarkable, though many of them contain good paintings. They are mostly built of dark red brick, and usually Gothic. Some of the ancient palaces of Cremona are beautiful specimens of architecture. Cremona is the seat of a bishopric, and has civil, criminal, and commercial tribunals. It has a lyceum, gymnasium, a public library, two theatres, &c. It has considerable manufactures of linen, silk, earthenware, colours, and mustard, the latter of which is much esteemed in Italy. It was at one time celebrated for its violins, but its reputation for these instruments has now much declined. Their manufacture was almost wholly confined, for nearly 100 years, to a family of the name of Amati. The first of this family who distinguished himself as a violin-maker was Hieronymus Amati, who became famous about the beginning of the seventeenth century. Antonius Straduarius and Joseph Guarnerius were also celebrated violin-makers of Cremona. The former was a contemporary of the last two Amati; the latter flourished at the commencement of the eighteenth century. Instruments by these makers are now scarce, and bring a high price.

Cremona was colonized by the Romans B.C. 219, and again B.C. 190, and became a populous and flourishing town. In the war between Vitellius and Vespasian it was plundered and burned by the troops of the latter, but was subsequently rebuilt by Vespasian. After the fall of the empire it shared the fate of the other cities of Lombardy, and eventually fell under the dominion of the Visconti of Milan, from which time it continued to form a part of the Milanese state. In 1796 it was taken possession of by the French, and was included in the Cis-Alpine Republic, and afterwards, from 1800 to 1814, in the Kingdom of Italy under Napoleon. Vida, bishop of Alba, the celebrated Latin poet, was born here in 1490. Pop. in 1872, 30,919.

CRENIC AND APOCRENIC ACIDS (Greek *krēnē*, a spring) are two organic substances which Berzelius found in the mineral water of Porla, in Sweden, and which occur in the yellow deposits from chalybeate springs, and in the water of ditches and bogs. Very considerable importance has been attached by agricultural chemists to their presence in the soil, as enabling plants readily to receive ammonia, iron, and other mineral matters; and the whole question connected with their origin from more highly organized vegetable matter by the action of air, moisture, light, heat, and mechanical subdivision, with their derivation from one another by oxidation, with their character and physiological functions, has been discussed at length by Mulder. Crenic acid is a white, uncrystallizable substance, with an acid astringent taste. Apocrenic acid is brown, sparingly soluble in water, and very astringent. Both acids combine with alkalies and alkaline earths, with iron and other metals, and according to Mulder, from salts which may contain even five bases. As to their composition, it is probable that they do not contain nitrogen, and that the presence of that element is due to ammonia combined with the acid. Their exact composition, however, is still undetermined.

CREOLE (from the Spanish *Creollo*) is the name which was originally given to all the descendants of Spaniards born in America and the West Indies. It is used in a wider sense to signify the descendants of Europeans of any nation born in certain parts of South America and the West Indies.

In 1776 Charles III., king of Spain, declared the Creoles capable of civil, military, and ecclesiastical offices, from which till then they had been excluded. Native Spaniards, however, still continued to have the preference, and the Creoles were treated with the arrogance which too often distinguishes the conduct of the natives of a parent country towards colonists; and the consequence was great exacerbation of feeling on the part of the Creoles. In the West Indies the Creoles have always enjoyed equal rights with native Europeans. Before the declaration of independence by the colonies of Spanish America there existed marked lines of distinction between the different classes, founded on difference of birth. The *Chapetones* were Europeans by birth, and first in rank and power; the *Creoles* were the second; the *Mulattoes* and *Mestizoes* (descendants of white and black, or white and Indian parents) formed the third class; *Negroes* and *Indians* the fourth. At present they are all entitled to equal privileges by the constitutions. Some of Bolivar's generals were dark Mulattoes, and Paez a Llanero. The Llaneros are converted Indians. The native Spaniards formerly avoided associating with the Creoles, and formed the

first class. In Venezuela there existed a kind of Creole nobility, unknown in other parts of South America. They were called *Mantuanos*, and divided themselves into those of *Sangre Azul* (blue blood), descendants of the first Spanish conquerors, and those of *Sangre Mezclada* (mixed blood), Creole families of a later origin who had intermarried with Spaniards or Frenchmen. The Creoles in general, before the revolution, were very lazy, leaving the mechanical arts and husbandry altogether to the mulattoes, negroes, or Indians; and even now the mechanics are mostly coloured or black persons. The ladies are of a sallow complexion, have beautiful teeth, large, dark eyes, and are, like the men, very finely formed.

Creole dialects are those jargons which have originated from the mixture of different languages in the West Indies, and are spoken by the descendants of the slaves. According to the European language which prevails in a Creole dialect it is called *French-Creole*, *Danish-Creole*, &c. In St. Thomas, for instance, the latter is spoken; in Hayti, French-Creole. Among the numerous corruptions of European words and constructions we find very generally, in the Creole dialects, the corruptions of grammar common among children; for instance, *me* is used instead of *I*. Often no distinction is made between the possessive pronoun and the personal; for example, *me house* for *my house*, or *wi massra* for *our master*. The infinitive is used for the finite tenses, as *moi donner* for *je donne*. The mixture of words from different languages is often considerable in these dialects; but most of them can be understood without a great deal of difficulty by a man acquainted with English, Danish, French, and Spanish. We will give an example of the Papimento language—a Creole dialect spoken in St. Thomas—from a work extracted from the four Gospels entitled Da Tori va wi Massra en Helpiman Jesus Christus, so leki wi findi datti na inni dem fo Evangeliste: Mattheus, Marcus, Lucas, en Johannes, 1816 (The Story of our Lord and Saviour Jesus Christ, as we find it in the four Evangelists, &c.) A part of the first chapter of the Gospel of St. John, from the fourth to the eighth verse, is given in this work as follows:—'Libi ben de na inni va hem, Kaba da libi ben de Kandera va somma. Kaba da Kandera de krini na dungru, ma dungru no ben teki da Kandera. Gado ben senni wan somma, dem kali Johannes, dissi ben Komm va takki vo da Kandera, va dem somma Komm bribi na da Kandera. Hem srefi no da Kandera, ma a ben Komm va takki na somma vo da Kandera.' This specimen will give an idea of the strange mixture of words, and of the clumsy periphrases used to express ideas, for example, *libi ben de na inni va hem;* of the poverty, for example, *ben* for *been*, *has been*, *has*, *was*, and *had*, &c. There are, however, in all languages, heavy periphrases, our familiarity with which prevents us from being sensible of them; for example, *je venais de chez moi*, or *he is about to set out on a journey;* which, if we had one word for *undertaking a journey*, and a tense for expressing the intention, might be expressed in one word. That a careful investigation of the Creole dialects would lead to several interesting discoveries respecting the origin of some grammatical formations and modes of expression is hardly to be doubted; but comparatively little has as yet been done in this branch of study.

CREON, King of Corinth. See MEDEA.

CREON, King of Thebes. See ETEOCLES.

CREPITATION, a name given in the medical art to a sound resembling that produced by some salts when thrown on burning coals, or exposed in a vessel to an intense heat. Crepitation is produced in several organs, and by different causes, as from the penetration of the air into the pulmonary cells. When the tissue of the lung is inflamed a kind of crackling sound or rattle is heard, and forms one of the characteristic symptoms of pneumonia. The same sound is heard when in the dead body a portion of healthy lung is pressed between the fingers; this crepitation does not take place in the lung of an infant which has died without having breathed. In fractures, when simultaneous and opposite movements are impressed on bony fragments, a sound of crepitation is perceived by the ear, or sometimes an indication of it transmitted by vibration to the hand. The sound thus furnishes a means of ascertaining when actual fracture has taken place; but, to avoid mistake, it ought to be remembered that crepitation is occasionally produced by the friction of the tendons or articular surfaces, and may therefore be no indication of fracture.

CRESCENDO, or CRES. (Italian), a musical term signifying that the notes of the passage over which it is placed are to be gradually swelled. This form of expression is not of modern invention. The ancient Romans, as we learn from a passage in Cicero, were aware of its beauty, and practised it continually. Crescendo passages are frequently marked $<$ signifying piano to forte; the corresponding mark $>$ diminuendo, marking the transition from forte to piano.

CRESCENT (*crescens*, Latin), an emblem representing the moon in her state of increase. This emblem of the Ottomans is of very high antiquity. The Egyptians had their Isis, the Greeks their Diana, and it is easy to conceive that the crescent, which announced the returning light of the moon, soon became an object of worship with such people. Thus Isis, Diana, and the bull Apis are decorated with this emblem; which is also found on medals of Alexander, and other ancient monuments of art. The citizens of Athens of illustrious birth wore crescents of ivory and silver upon their buskins; and the same mark of distinction was granted to the patricians and senators of Rome. They were called *lunulati calcei*. The crescent was often used by females as an ornament for the head; an example of which may be seen on a bust of Marciana, in the Villa Pamfili. On many medals of queens the bust is supported by a crescent, expressive of the relation they bore to their husbands, who, as kings, were as the sun, while they were as the moon. It is also an emblem of the eternity of an empire. The god Lunus bears it upon his shoulder; and the *denarii* of the Lucretian family have it accompanied by the *Seven Stars* of the northern hemisphere. It is also found on medals of many cities, particularly of Byzantium, from whence it is supposed to have been borrowed by the Ottomans. Since their establishment in Europe it has been the universal emblem of their empire. It decorates their minarets, their turbans, their ensigns, their insignia; everything appertaining to the Mussulmans is characterized by this sign, and their states are designated as the Empire of the Crescent. During the Crusades, particularly, the crescent was the distinguishing symbol of the Mussulmans, as the cross was of the Christians.

CRESCENZI, PIETRO, or PETRUS DE CRESCENTIIS, the restorer of the scientific study of agriculture in Europe, was born at Bologna in 1230; died in 1307. He figured as an attorney and magistrate till he was obliged by civil troubles to leave his native country. He then travelled through Italy, and collected useful observations. It was not till after thirty years of absence, when order was at length restored to his native city, that he was permitted to return; and at the age of seventy he was made senator. He now carried into execution his principles of agriculture on an estate near Bologna, in the cultivation of which he passed the remainder of his life. He has left a work on

agriculture entitled Opus Ruralium Commodorum. He submitted this work to the examination of learned men in Bologna, by whom it was corrected and improved. It is a remarkable monument of his time, of which it is far in advance. This work, in the arrangement of which the author seems to have followed Columella, was written originally in Latin. There exists an Italian translation (Florence, 1478), which is esteemed very highly on account of the purity of the language, and has given rise to the opinion that Crescenzi wrote in his native tongue. He understood the ancients, and made use of their writings. His principles are simple, founded upon experience, and free from many prejudices which continued to prevail in Europe for centuries after. His work was no sooner published than it spread throughout Europe. It was translated into several European languages, particularly for Charles V. of France, in a splendid manuscript (1373), which is still extant; and no sooner was the art of printing invented than copies of this work were greatly multiplied. The oldest known edition, which is now very rare, appeared at Augsburg in 1471 in folio. The earliest Italian translation, the author of which is supposed to be Lorenzo Benvenuti of St. Geminiano, and which is accounted among the models of language, is contained in the collection of the Classici Italiani (Milan, 1805). A more exact, but a less esteemed translation, was made by Sansovino.

CRESCIMBENI, Giovanni Maria, a scholar and poet, was born at Macerata, in the Mark of Ancona, Oct. 9, 1663. When but a child he displayed an inclination for poetry. Ariosto's verses, in particular, were impressed on his memory by an edition of the Orlando Furioso, with copperplates, in which he used to search for and peruse the passages to which the engravings referred. In the Jesuits' college at Macerata he wrote at thirteen a tragedy—Daris. At fifteen he was a member of an academy, and at sixteen Doctor of Laws. His father sent him in 1681 to Rome to perfect himself in the knowledge of law; but he applied himself with still more zeal to poetry. Some *canzoni* of Filicaja in 1687 gave him correct views of the character of the poetry then in vogue. Dissatisfied with all that he had formerly attempted, he felt himself at once constrained to imitate only the ancient models, and to recommend their simple and natural manner to his contemporaries. Crescimbeni belonged to all the three academies in Rome, which rivalled each other in wretched verses. Out of these he selected certain members, whose views harmonized with his own, and formed a new academy, which was sportively called the *Arcadia*, in allusion to the rural taste of the founder. He was the first *custode* of this academy, under the name of *Alfesibeo Cario*, and was re-elected to the office for several successive olympiads. In 1698 appeared his Istoria della volgar Poesia, a work of vast industry, but destitute of method and criticism. He next published his Trattato della Bellezza della volgar Poesia (Rome, 1700, 4to), which passed in a short time through three editions, and like the earlier work was first made capable of being understood and enjoyed by the Commentarj intorno alla Storia della volgar Poesia (Rome, 1702, five volumes 4to). He made a translation of Nostradamus's Lives of the Provençal Poets, with additions, enlarged his own Commentaries with four volumes, and wrote a History of the Arcadia, and Lives of the Arcadian Poets. About this time also appeared the two first volumes of verses (*Rime*) of his Arcadia. Clement V. and Benedict XIII. rewarded his labours with ecclesiastical honours; and John V. of Portugal presented the Arcadia with some funds. The society erected a theatre, still existing, on the Janiculum, and their first olympic games were celebrated September 9, 1726, in honour of the King of Portugal. After being admitted into the order of the Jesuits he died March 8, 1728.

CRESPI, Giuseppe Maria, surnamed *lo Spagnuolo*, a painter of the Bolognese school, was born at Bologna in 1665, and studied the masterpieces in the monastery of *San Michaele in Bosco*, and particularly imitated the Caracci, whose works he also copied. He received instruction from Canuti, then from Cignani, afterwards studied in Venice and Parma, and finally came out with his own productions in his native city. His first work was the Combat of Hercules with Antæus. From this time he had continual employment. He painted for Cardinal Ottoboni the Seven Sacraments, now in the Dresden gallery; several pieces for Prince Eugene of Savoy, for the Elector of the Palatinate, for the Grand-duke of Tuscany, and for Cardinal Lambertini, his patron, who afterwards, when Pope Benedict XIV., conferred on him the honour of knighthood. Crespi, however, has been frequently censured for the singular ideas which he often introduced into his paintings; for example, he represents Chiron giving his pupil Achilles a kick for some fault that he had committed. Moreover, he painted everything *a prima*, with strong, bold strokes, in the manner of Caravaggio, and became a mannerist from a desire to be constantly new. He had many scholars, among whom were his two sons, Antonio and Luigi Crespi. The latter distinguished himself by his writings on painting. Crespi died in 1747.

CRESSY. See Crecy.

CREST (from the Latin *crista*) is used to signify the rising on the defensive armour of the head, also the ornament frequently affixed to the helmet, such as a plume or tuft of feathers, a bunch of horse-hair, &c. Warriors have always been in the habit of adorning their persons; and the helmet, from its conspicuousness, is very naturally chosen as the place of one of the principal ornaments. We learn from Homer (Il. iii. 336) that the crests of the earlier Greeks were of horse-hair; afterwards plumes, especially red ones, were adopted (Virg. Æn. ix. 50, 271, 808). To gain an enemy's crest was accounted an honourable achievement, as it was reckoned among the *spolia*. The Greeks called the crest *lophos*. The Æginetan statues (see Æginetan Style) have crests of horse-hair. In the middle ages, when rank and honours became hereditary, and particular heraldic devices were appropriated to particular families, the crest became a distinguishing hereditary mark of honour. It denotes in heraldry a figure placed upon a wreath, coronet, or cap of maintenance, above both helmet and shield; as, for instance, the crest of a bishop is the mitre. The crest is considered a greater criterion of nobility than the armour generally. It is commonly a piece of the arms, as that of Castile is a castle. Crests, therefore, form an important subject in heraldry.

CRETACEOUS (or Chalk) SYSTEM, a name applied by geologists to the series of rocks which occur between the *Wealden* group, or, when it is wanting, the Oolite and the lower part of the Tertiary formation. It is usually characterized by white, soft chalk, but sometimes, more especially in Italy and the south of France, this chalk is replaced by compact, solid limestones. The Cretaceous rocks consist chiefly of carbonate of lime, but usually abound with silex, in the shape of nodules, plates, and veins, and with iron pyrites in nodules and radiated cylinders. The organic remains in the Chalk are, with few exceptions, eminently marine, and from the fine texture of the substance in which they have been imbedded, are usually well preserved. They embrace sea-weeds, sponges, corals,

echinoderms, molluscs, crustacea, fishes, and reptiles. It appears from recent deep-sea dredgings in the Atlantic that a fine, white, organic ooze, resembling the Chalk, is still in progress of formation in the oceanic abysses at the present day.

CRETE. See CANDIA.

CRETINISM, a disease occurring in Switzerland and other mountainous countries, and nearly resembling rickets in its general symptoms. It differs principally in its tendency to that peculiar enlargement of the thyroid gland which in France is denominated *goitre*, and in the mental imbecility which accompanies it from the first. The enlargement of the gland does not always, however, accompany the other symptoms, though it does generally.

Cretinism was first distinctly noticed and described by Plater about the middle of the seventeenth century, as occurring among the peasants in Carinthia and the Valais. It was afterwards found, in a still severer degree, in other valleys of Switzerland, and the Alps generally. It has since been detected in various other regions, where the country exhibits similar features, as among the miserable race called *Cagots*, inhabiting the hollows of the Pyrenees, and in Chinese Tartary, where it is represented as existing by Sir George Staunton.

On the first discovery of cretinism it was ascribed by some to the use of snow-water, and by others to the use of water impregnated with calcareous earth, both which opinions are without foundation. The first is sufficiently disproved by the fact that persons born in places contiguous to the glaciers, and who drink no other water than what flows from the melting of ice and snow, are not subject to this disorder; and, on the contrary, that the disorder is observed in places where snow is unknown. The second is contradicted by the fact that the common water of Switzerland, instead of being impregnated with calcareous matter, excels that of most other countries in Europe in purity and flavour. The water usually drunk at La Batia and Martigny is from the river Dranse, which flows from the glacier of St. Bernard, and falls into the Rhone. It is remarkably free from earthy matter, and well tasted. At Berne the water is extremely pure; yet, as Haller remarks, swellings of the throat are not uncommon in both sexes, though cretinism is rare. As comfortable and congenial warmth forms one of the best auxiliaries in attempting the cure of both cretinism and rickets, there can be no doubt that the chill of snow-water must considerably add to the general debility of the system when labouring under either of these diseases, though there seems no reason for supposing that it would give rise to either. It is not difficult to explain why water impregnated with calcareous earth should have been regarded as the cause; for in cretinism, as in rickets, the calcareous earth, designed by nature for the formation of the bones, is often separated, and floats loose in various fluids of the body, for want of a sufficiency of phosphoric acid to convert it into a phosphate of lime, and give it solidity. And as it is, in consequence, pretty freely discharged in the urine, this seems to have given rise to the opinion that such calcareous earth was introduced into the system with the common water of the lakes or rivers, and thus produced the morbid symptoms.

M. de Saussure has assigned the real cause of the disease. The valleys of the Alps, he tells us, are surrounded by very high mountains, sheltered from currents of fresh air, and exposed to the direct, and, what is worse, the reflected rays of the sun. They are marshy, and hence the atmosphere is humid, close, and oppressive; and when to these causes we add the meagre innutritious food of the poor of these districts, their indolence and uncleanliness, with a predisposition to the disease from a hereditary taint of many generations, we can sufficiently account for the prevalence of cretinism in such places, and for the aggravated character which it assumes.

Though the general symptoms of cretinism are the same as those of rickets, the disease shows itself earlier, often at birth, and not unfrequently before this period, apparently commencing in the incipient fœtal state, and affording the most evident proofs of ancestral contamination. The child, if not deformed and diseased at birth, soon becomes so; the body is stunted in its growth, and the organs in their development.

CREUSA, the name of several celebrated females of antiquity.—1. Daughter of Erechtheus, who, before she was married to Xuthus, gave birth to Ion, the fruit of an amour with Apollo. To her second husband she bore Achæus.—2. The daughter of Priam and Hecuba, wife to Æneas, and mother of Ascanius. In the tumult of the conflagration of Troy, when Æneas fled with the images of his gods, with his father and son, he lost her, and after he had sought her a long time in vain her spirit appeared to him, saying that the mother of the gods had taken her to herself because she was not willing that she should leave Phrygia.

CREUSE, an inland department, France, formed of parts of the provinces of Poitou, Marche, Bourbonnais, Limousin, and Berry; bounded N. by the department Indre and Cher; E. by Allier and Puy de Dôme; S. by Corrèze; and S. and W. by Haute Vienne; capital, Gueret; area, 2150 square miles; pop. (1872), 274,663. It derives its name from the river Creuse, which rises in it, and traverses it diagonally in a north-west direction. The surface is generally rugged, and the soil, which is thin, and rests upon granitic rocks, is by no means fertile. The mountain ranges are connected with those of Auvergne and Limousin. The loftier heights are covered with chestnut forests, the lower slopes devoted to pasture, and the low lands only under tillage. Coal is the only mineral worked in this department. The chief manufactures are carpets and tapestry. A great number of the inhabitants emigrate in March in search of work, and return about Christmas. The department is divided into four arrondissements, consisting of twenty-five cantons, containing 261 communes.

CREUTZ, GUSTAF PHILIPP, GRAF VON, a Swedish poet and statesman, was born in Finland in 1726. He was a member of the learned and elegant circle which surrounded the Queen of Sweden, Louisa Ulrica, sister of Frederick the Great; and his Atis og Camilla, an erotic poem in five cantos, published at Stockholm (1761), grew out of the meetings of this society. This poem and his Letter to Daphne are considered as master-pieces in Swedish poetry. He was appointed minister to Madrid, and, at a later period, to Paris, where he remained twenty years, and became particularly acquainted with Marmontel and Grétry. April 3, 1783, he signed with Dr. Franklin a treaty of amity between the United States and Sweden. He was afterwards placed at the head of the department of foreign affairs in Stockholm, and was created chancellor of the University of Upsala, but he could not endure the climate of his country, and died in 1785. His works and those of his friend Gyllenborg are published together under the title Vitterhets Arbeten of Creutz og Gyllenborg (Stockholm, 1796).

CREUZOT, LE, a town of France, department Saône-et-Loire, 14 miles from Autun and 6 from the Canal du Centre, celebrated for its extensive ironworks, the most complete in France, founded in

1837 by the firm of Schneider & Co. The neighbourhood contains extensive coal-mines. The iron ore employed is mostly brought from a distance. There are 10 blast-furnaces, which yield an annual production of pig-iron of 130,000 tons. The coal raised in the neighbourhood amounts to 250,000 tons per annum. The forge employs 85 steam-engines, 30 steam-hammers, 130 puddling furnaces, 41 rolling-mills, and produces annually 110,000 tons of iron. The constructive works turn out, among other mechanism, 110 locomotives per annum, and marine engines to the annual extent of 40,000 horse-power. In 1865 Creuzot furnished 15 locomotives to the Great-Eastern Railway, the first French locomotives used in England. Numerous iron-bridges, as at Fribourg, Brest, Toulon, &c., have been made here. The steam-hammer was first put in operation at Creuzot, M. Bourdon, the chief-engineer of this work, having preceded Mr. Nasmyth in the construction of this instrument. There is a railway from the works to the canal. The workmen at Creuzet number nearly 10,000. Various benevolent and provident funds are accumulated by them on plans organized for them by the employers. Out of these the expenses of schools, medical attendance, retiring pensions, &c., are provided. Drunkenness and quarrels, M. Duruy says, are unknown at Creuzot.

Creuzot in 1780 contained only a few miserable cabins situated on a barren soil among bare hills. In 1781 a cannon-foundry was established, which was patronized by the royal government, and maintained till 1815; and a crystal manufactory was established by Marie Antoinette, and continued in existence till 1832. The iron-work passed subsequently through various hands, but did not attain great importance till it came into those of Messrs. Schneider. Pop. 23,872.

CREWE, a market town, England, Cheshire, 32 miles south-east of Liverpool. It sprung up into existence within a few years, and owes its importance to its being the central point where various branches of the London and North-western and other lines of railway meet. The houses, provided with gardens, have a very pleasing appearance, and are chiefly inhabited by persons connected with the railways. There are rolling-mills, iron-forges, and other works connected with the repair of the London and North-western Co.'s lines. Pop. (1871), 17,810.

CREWKERNE, a town, England, county Somerset, 16 miles south-east of Taunton, is pleasantly situated in a fertile vale, well wooded, and surrounded by cultivated eminences. The streets are well paved, and present altogether a neat and cleanly appearance. The church is a large cruciform structure, with a lofty and richly-ornamented tower. There is a free grammar-school, founded in 1499, with four exhibitions to any college in Oxford. Serges were woven here to a great extent at one time, but the trade is now wholly extinct, and its place supplied by the manufacture of sail-cloth, dowlas, and stockings. Pop. 3567.

CRIBBAGE, a favourite English game at cards for two, three, or four persons. It is played with the whole pack of cards. When there are three players, each plays for himself; when there are four, two play against two. The whole theory of the game is contained in the rules and method observed in five-card cribbage for two, which is played in the following manner. The players decide who is to deal first by cutting, the lowest card cut carrying the deal with it. The dealer begins by dealing five cards to each player, after which each of the players throws out two cards, face downwards, to form the *crib*, which belongs to the dealer, the non-dealer throwing first. The elder hand (that is the non-dealer) now cuts the remaining cards on the table by lifting any number not fewer than three, and the dealer lifts the top card left on the table and turns it face upwards. In counting the score at the end of the play this turn-up card is reckoned with the cards of each player, and also with the crib. The game is won by the player who first makes sixty-one points. The score is counted with pegs, which are inserted into holes in a cribbage-board; and the points are reckoned in two ways—first, in the course of the play, and, secondly, after the play is over. The following are the points which can be made:—(1) Every *pair*, that is, every couple of cards of the same value belonging to different suits (two aces, two fours, two kings, &c.), counts two, and when there are three or four similar cards, as many pairs are counted as there are different combinations of the cards taken two at a time. Thus when there are three similar cards (for example, the kings of clubs, spades, and diamonds) three combinations may be formed (the king of clubs with the king of spades, the king of clubs with the king of diamonds, and the king of spades with the king of diamonds), and six points are scored. This is called a *pair-royal*. When there are four similar cards six different combinations may be made, and twelve points are scored. This is called a *double pair-royal*. The double pair-royal, in play, can only be counted on cards under the eight. (2) A sequence consists of three or more cards of any suit following one another in rank, and counts one for each card. In counting the cards after the play, as many different sequences are counted as there are different combinations of three or more cards following one another in rank. Thus, if there are five cards in a hand, including the turn-up card, and if there are among them an ace, a two, and two threes, two sequences are counted, one being made with each of the threes. In this case, accordingly, six points are scored. If there are three threes, besides an ace and a two, three sequences are made, and nine scored; and if the five cards consist of an ace, two twos, and two threes, four sequences are made, and twelve scored in the following way:—

1	2	3	1	*2*	3
1	2	*3*	1	*2*	*3*

(3) Every combination of cards, the united pips of which make up *fifteen*, counts two. In reckoning the fifteens an ace counts one, and every court card ten. These three methods of making points are applicable both in playing and in counting the cards after playing. (4) When all the cards in a hand, either with or without the turn-up card, are of one suit, or when all the cards in the crib, with the turn-up card, are of one suit, it is called a *flush*, and counts one for each card. (5) When the turn-up card is a knave, the dealer scores two. This is what is called 'two for his heels.' The two for his heels must be scored before a card is played, otherwise it is lost. (6) When a knave of the same suit with the turn-up card is found in the hand of either player, the player in whose hand it is scores one. This is what is called 'one for his nob.' (7) The non-dealer in five-card cribbage scores three points at the commencement of the game, called 'three for last;' but this is not done in six and eight card cribbage. The cards having been dealt, the crib cards thrown out, and a card turned up by the dealer, as already described, the elder hand plays a card and is followed by the dealer. Each card played out is laid face upwards on the table before the player, the cards of each player being kept separate. In playing, the number of the pips on each card is counted, and the number of those on the second is added to the number of the first, those of the third to the two

previous, and so on, up to but not beyond thirty-one. When a card played by either of the players brings the number of the pips up to exactly fifteen or thirty-one, the player counts two. When the player whose turn it is to play cannot play a card without going beyond thirty-one, the other player scores one for having been the nearest to thirty-one. This is called scoring one for the 'go.' The remaining cards, after thirty-one, or the next point to it, is made, are thrown up and each player's cards are counted. In counting pairs and sequences in the course of the play the cards of the players are counted together as played, and the pair or sequence is reckoned to the one who played the last card of it. Pairs, pairs-royal, and double pairs-royal are only counted when the cards composing them are played in immediate succession. Sequences are counted whatever be the order in which they are played, but they must not be broken by the intervention of a card out of the sequence. Three or four hand cribbage differs from two-hand cribbage in the fact that the players each put only one card into the crib, and when thirty-one, or as near as can be, has been made, then the next eldest hand leads, and so on, all the cards being played out before the players begin to count. In six-card cribbage the players retain each four cards, all of which are played out before counting. For the sake of illustration, let us suppose a case in which there are two players to each of whom six cards have been dealt, and let us suppose that after throwing out the crib cards the elder hand has a five, a six, a seven, and an eight, and the dealer a four and three sevens. If the elder hand begins by playing an eight the dealer will follow with a seven, bringing the number up to fifteen, and scoring two. The elder hand then plays another seven, bringing the number up to twenty-two, and scoring two for the pair; after which the dealer plays a third seven, bringing the number up to twenty-nine, and scoring six for the pair-royal. It will now be seen that the elder hand cannot play another card without going beyond thirty-one, and as the dealer cannot do so either, he scores one for playing the last card below the thirty-one, when the cards are turned and the elder hand begins again. Let us suppose that he resumes by playing a six, and that the dealer follows with a four; the former then plays his five, counting two for the fifteen, and three for the sequence of three (four, five, six); lastly, the dealer plays his seven, and scores four for his sequence of four (four, five, six, seven), and one for the last card. The elder hand now reckons up the number of points which may be made out of the cards in his hand, along with the turn-up card, and adds the same to the number he has scored in the course of the play. After him the dealer counts first his hand and then the crib in the same way, and if neither has reached sixty-one, the cards are dealt again, and the game goes on as before. It must be remembered that it is always the first out who is game, and that accordingly as soon as either player has reached sixty-one the game is stopped, even although his opponent might have made a much larger score had the game been continued. It follows from this that if the elder hand in counting his hand after the play reaches the total of sixty-one, the dealer has no opportunity of counting his hand and crib at all. The advantage of the crib is thus counterbalanced by the fact that the holder of the crib always counts his cards last. The crib changes hands every time the cards are dealt. Although in the example given above we have supposed, for the sake of exhibiting a greater variety of points made in the course of the play, six cards to be dealt to each player, yet it ought to be mentioned that five is the number usually dealt, as that number makes a better game.

CRICHTON, James, was born in Scotland in 1561 or 1560 (according to Mackenzie, 1551), of a noble family. On account of his remarkable endowments, both of body and mind, he obtained the surname of the *Admirable*. He was educated at the University of St. Andrews, and according to the current accounts of him, before his twentieth year, had run through the whole circle of the sciences, could speak and write to perfection ten different languages, and was equally distinguished for his skill in riding, dancing, singing, and playing upon all sorts of instruments. Thus accomplished, he set out on his travels, and is said to have gone to Paris, where he offered to dispute in any art or science, and to answer whatever should be proposed to him in any of these twelve languages—Hebrew, Syriac, Arabic, Greek, Latin, Spanish, French, Italian, English, Dutch, Flemish, and Slavonic; and this either in prose or verse, at the option of his antagonist. On the day fixed he is said to have maintained the contest from nine o'clock in the morning until six at night, to the great admiration of the spectators, who saluted him as the 'Admirable Crichton.' Before and after the dispute he was engaged in tilting, vaulting, &c., or in balls, concerts, and other similar amusements. After similar exhibitions at Rome and Venice, we find him, in 1581, at Padua exposing the errors of Aristotle, astonishing his hearers with his ingenuity and elegance in an extempore oration in praise of ignorance; and, finally, to confound his enemies, offering to prove the fallacies of Aristotle and the ignorance of his commentators, to dispute in all the sciences, to answer all that should be proposed or objected in the common logical way, or by numbers and mathematical figures, or in a hundred sorts of verses, and during three days sustaining this contest with a spirit and energy, with such learning and skill, as to obtain the praises and admiration of all men. His next exploit was at Mantua. There was in that city a famous gladiator, who had foiled the most skilful fencers in Europe, and had lately killed three persons who had entered the lists with him. Crichton offered to fight him for 1500 pistoles, and, having slain him in the contest, he distributed his prize among the widows of the three persons above mentioned. The Duke of Mantua, in consequence of his wonderful performances, chose him preceptor to his son—a youth of a dissolute life and riotous temper. To amuse his patron Crichton composed a comedy ridiculing the weaknesses of men in all employments, and sustained fifteen characters in his own play, 'setting before the eyes of the spectators the overweening monarch, the peevish swain, the superficial courtier, the proud warrior, the dissembling churchman, the cozening lawyer, the lying traveller, the covetous merchant, the rude seaman, the pedantic scholar, and the tricksy servant.' During the carnival (1583), or, according to other authorities, in July 1582, while amusing himself with his guitar, he was attacked by half a dozen persons in masks. He defended himself, and disarming their leader found him to be his own pupil. Crichton fell on his knees, and presented his own sword to the prince, who immediately stabbed him to the heart. The cause is said to have been jealousy of a successful amour.

Crichton's claims to admiration have been the subject of much disputation. Dr. Kippis, the editor of Biographia Britannica, first subjected them to critical examination, and concluded that Sir Thomas Urquhart, who is the sole authority for several of the facts mentioned of him, was wholly unworthy of credit. Of the incidents enumerated above, the won-

derful exhibitions of Crichton at Paris, his triumphs at Rome, his combat with the gladiator, his writing an Italian comedy and sustaining fifteen parts in it, and the cause of his death are among those discredited. Scaliger speaks of Crichton with considerable contempt. On the other hand, he has been defended by Tytler and others; but there is no certainty as to his actual achievements. He left four Latin poems, which, according to Dr. Kippis, are possessed of no remarkable quality, and will not stand the test of an examination even as to quantity.

CRICKET (*Gryllus*, Linn.; *Acheta*, Fab.), a genus of orthopterous or straight-winged insects, belonging to the family Gryllidæ, which comprises the grasshoppers, mole-crickets, crickets proper. This family, like all other Orthoptera, do not undergo a complete transformation. They are hatched from eggs symmetrically stuck together by a viscous material, either upon vegetables, or placed under ground; and, from the moment of escaping from the egg, the young are sufficiently vigorous to seek their own food, which consists of organized substances. While yet very soft, they are perfectly formed, with the exception of the rudiments of the *elytra* and wings. These, in some species, are never developed. As the insect grows, the skin becomes too small, and requires to be changed as often as eight or ten times before the attainment of its full size. The crickets are distinguished from the other members of this family by their long silken *antennæ*, by having but three joints to their *tarsi*, and by the comparative slenderness of their thighs. Their bodies are short, thick-set, and soft, with the head, corselet, and abdomen immediately applied, and of equal length and breadth. The head is thick, rounded above, and nearly vertical. Between the eyes, which are widely separated and reticulated on the surface, there are two brilliant *stemmata*. The corselet is quadrangular, somewhat larger transversely, and rounded at the edges. The elytra, which do not completely cover the belly, are curved squarely, and are not roof-shaped, as in the locust and grasshopper. In the winged species the wings exceed the elytra, and even abdomen, beyond which they project in the form of a sort of bifid tail. In addition to the two flexible abdominal appendages common to both sexes, the females have a long borer or oviduct, which is a stiff, square tube, formed of two pieces, separable, and free at the point, sometimes seeming to be split, and terminating by a slight enlargement.

The noise for which all male crickets are remarkable, and usually called *chirping*, is produced by the friction of the bases of their elytra, or wing-cases, against each other, these parts being curiously adapted to produce this sound. Both sexes have the elytra longitudinal, divided into two portions, one of which is vertical or lateral, covering the sides, and the other dorsal, covering the back. These portions in the female have their nervures alike, running obliquely in two directions, forming, by their intersection, numerous small meshes, which are of a rhomboidal or lozenge shape. The elytra of the females have an elevation at the base. The vertical portion in the males does not materially differ from that of the females, but in the horizontal part the base of each elytrum is so elevated as to form a cavity beneath. The nervures are stronger, and very irregular in their course, with various inflexions, curved, spiral, &c., producing a variety of differently sized and shaped meshes, generally larger than in the female; towards the extremity of the wing, particularly, there is a nearly circular space, surrounded by one nervure, and divided into two meshes by another. The friction of the nervures of the convex surface of the base of the left or undermost elytrum against those of the concave surface of the base of the right one, causes vibrations of the membranous areas of an intensity proportioned to the rapidity of the friction. In fact, the insect may be regarded as performing on a sort of violin, the base of one elytrum serving for a bow, and the cords of the other as the strings of the instrument. The reader, who may wish to enter upon a very minute study of the contrivances in this and similar insects for producing sounds, may advantageously consult De Geer (vol. iii. p. 512), and Kirby and Spence (24th letter, vol. ii. p. 375 et seq.) The chirping of the domestic cricket (*Gryllus domesticus*) is by many regarded as pleasant or musical, and their presence in houses is regarded as a good omen by some people. Where they are numerous, their noise is, to our ears, certainly anything but agreeable; and it requires considerable habituation to it to be able to sleep undisturbed by it. They are very harmless, taking up their abode near chimneys, fire-places, and other warm situations, whence they come out, when the inmates of the house have retired to rest, and commence their monotonous song. If a light be brought, they speedily retreat, leaping lightly to their holes, the length and peculiar structure of their long thighs especially fitting them for this mode of progression. One action which we have observed them perform with the antennæ shows the delicacy and perfection of the muscles. They move these long silken appendages, as if cleaning or polishing them, somewhat as we see birds do with their feathers. The field-crickets (*G. campestris*) are as loud and noisy in the day as those above mentioned are at night, and largely contribute to the music of the fields, so delightful to the ear of the student of nature. Both species have attracted the attention of poets, who have celebrated their simple but lively notes in verse of various degrees of excellence. Both species are equally innoxious, subsisting on small particles of organized matter which might otherwise become troublesome from accumulation; while, from their numbers, birds and other animals obtain a part of their supply of food. The number of species is very large, fifteen being known in Europe.

CRICKET, a favourite athletic game long peculiar to England, but which in recent years has become universally popular in other parts of the United Kingdom, and also in America. It is of two kinds—double wicket and single wicket. The first is usually played by a company of twenty-two, ranged in two opposite sides of eleven each. Sometimes there are matches between eleven on one side, and a greater number, such as fifteen, eighteen, or twenty-two, on the other. The two sides toss up for the first innings; and two players of the side which wins the toss take their place respectively, bat in hand, at the opposite wickets. The players of the other side range themselves in various parts of the field to catch the ball when struck by the batsman, one of them stationing himself at one of the wickets as bowler. The object of the bowler is to strike down the wicket with his ball; if he succeed, the batsman is put out and another of his party takes his place. Should the ball, however, be struck away to some distance by the batsman, he and his partner run across and exchange wickets, and continue to do so as long as they can without exposing themselves to the risk of being 'run out,' that is, of having the wickets struck by the ball while they are still out of their ground. In such a case, the player nearest the wicket struck is always the one who is out. Every change of wickets thus made counts one notch. When all the players on one side have been successively put out, those of the other party go in for their innings. After each side has had two innings, the number of notches which they have respectively

made are counted, and that side declared victorious which has scored the largest. Single wicket is now seldom played. In this form of the game the batsman always stands at the same end, and the wickets at his end are arranged in the same way as in double wicket. At the bowler's end there are two wickets placed at some distance from each other, with space for the bowler to bowl between them, and the remaining wicket is placed half-way between the bowler's and the batter's end, a little to the side so as to be out of the course of the ball. A single run is made by the batter running to this middle wicket and back to his own ground. Sometimes only a single wicket is placed at the bowler's end, and no middle wicket is used at all. In this case, a run is made by the batter running from his own to the bowler's end; but this method of playing single wicket has this disadvantage, that the batter has always to run to his own end after making a run, before the play can be resumed. The game of cricket is believed to be as old as the thirteenth century, though played in a different form; and the pastime was not known under its present name till a comparatively recent period. It is alluded to in Phillips' Mysteries of Love and Eloquence, published in 1685.

CRICKLADE, a town and parliamentary borough, England, county Wilts, 42 miles north of Salisbury, on the right bank of the Isis. The town consists of the parishes of St. Mary and St. Sampson, having respectively, in 1871, 431 and 1414 inhabitants. The church of the former is small; that of the latter a spacious cruciform building, with a lofty and highly-ornamented tower. It has places of worship for Independents and Wesleyan Methodists, several schools, and some minor charities. In consequence of the town of Cricklade having been convicted of gross bribery at a parliamentary election in 1782, the franchise was extended to the adjoining divisions of Highworth, Cricklade and Staple, Kingsbridge and Malmesbury. Pop. of parliamentary borough in 1871, 43,622.

CRIEFF, a town of Scotland, county Perth, beautifully situated, 16½ miles w. by s. of Perth, on a slope above the Earn, backed by lofty hills and crags. It consists of one principal street, in the centre of which is a handsome square; and of several other well-built streets, one of which leads to a bridge over the Earn. Nearly in the centre of the High Street stands the ancient cross, curiously carved in front. The principal manufacture is hand-loom weaving. Tanning, distilling, and malting are also carried on. The environs of Crieff are singularly beautiful, and its climate remarkably salubrious. Pop. in 1871, 4153.

CRILLON, Louis des Balbes de Berton de, one of the greatest warriors of the sixteenth century, and the friend of Henry IV. of France, was born in 1541 at Murs, in Provence, of a respectable family of Piedmont. Being a younger son, the name of *Crillon* was given him from an estate belonging to the family—a name which he so ennobled by his exploits and virtues, that the heads of the Balbe family adopted it for their own. The army called Crillon the *man without fear* (*l'homme sans peur*). Charles IX., Henry III., and Queen Margaret called him simply *le brave;* but Henry IV. gave him the surname of *le brave des braves*. His independence and nobleness of spirit were equal to his bravery, and his humanity and virtue were not less famous than his heroic achievements. He was distinguished in five successive reigns—those of Henry II., Francis II., Charles IX., Henry III., and, above all, in that of Henry IV. In his first campaign, as aide-de-camp to the Duke of Guise (1557–58), he contributed much to the speedy conquest of Calais, by a bold deed of arms. He was the first to storm the breach. Here he encountered the commander of the fort, grappled with him, and threw him into the moat. The English had spent eleven months in the reduction of the place; the French retook it in eight days. Crillon subsequently distinguished himself in the battles of Dreux (1562), Jarnac and Moncontour (in 1569), against the Huguenots. As a Knight of Malta the young hero gained renown in the Crusades against the Turks. Selim II. had taken Cyprus from the Venetians. The terror of the Moslem arms filled all Europe; a coalition was formed, and the famous naval battle of Lepanto fought in 1571. Crillon, in this action, displayed prodigies of valour, and, though wounded, was appointed to carry the tidings of the great victory to the pope and the King of France. Pope Pius V. and the King of France (Charles IX.) loaded him with honours and favours. The massacre of St. Bartholomew (1572), the preparations of which had been carefully concealed from Crillon, was loudly reprobated by him. We find him the following year at the celebrated siege of Rochelle, and subsequently in various military operations where there was need of courage and enterprise. Henry III. ventured to propose to him the murder of the Duke of Guise, which had been resolved upon by the estates of Blois. 'I cannot stain my honour with a deed of shame,' was his answer. He fought heroically for Henry IV. against the league, and distinguished himself at the battle of Ivry, and at the sieges of Paris and Laon. He succeeded in throwing himself into Quilleboeuf, which was defended by a small force against Marshal Villars. Villars summoned the city to surrender, representing to Crillon that it was impossible for him in an almost open place, with a comparatively feeble garrison, to hold out against his army: Crillon's answer was, '*Crillon est dedans, et Villars est dehors.*' Villars ordered an assault, but was repulsed, and the siege was raised. Finally, when the wars which had shaken Europe were terminated by the peace with Savoy, Crillon returned to Avignon, where he died in 1615.

CRIME is the term generally used to designate an act which is considered to offend the laws both of God and man. It implies freedom of will and a power of distinguishing between right and wrong. Hence young children, madmen, and idiots cannot commit crimes. But the circumstances under which full imputability or responsibility shall commence cannot be decided by general rules, but each case must be judged by itself. To constitute a crime there must be an intention manifested by an outward act. If the intention be wanting the act is merely accidental. If the outward act is wanting there is nothing for human tribunals to punish. Mere intention does not come under their cognizance. There are, moreover, many acts of guilt committed in every community which are not of a nature to be made the subject of legislation, and cannot be brought before the courts. On the other hand, there are in every state certain actions, in themselves naturally indifferent, but which are forbidden and punished as injurious to the community. These form the greater part of the class of mere offences against the police regulations. Many actions, in themselves indifferent, may, however, by reason of the heavy penalties attached to them, be classed among crimes in the technical and juridical sense. The degree of punishment imposed on any crime should be proportioned to the degree of injury voluntarily inflicted. *Quasi delicta* are injuries which must be repaired by their authors, though the intention to perpetrate an illicit act need not be evident. The Roman law has made such provisions in various cases. See Criminal Law.

CRIMEA, The (French, *Crimée;* German, *Krim;* ancient *Chersonesus Taurica*), a peninsula forming the most southerly portion of the Russian government of Taurida, to the mainland of which it is attached by the Isthmus of Perekop, about 17 miles long by 5 broad. It is situated between lat. 44° 40′ and 46° 5′ N., and lon. 32° 45′ and 36° 39′ E., has a maximum length, from Cape Tarkhan to Yenikale, east to west, of over 200 miles, and a breadth of 130 miles from north to south, and is estimated to have an area of 10,000 square miles. On the west and south it is washed by the Black Sea, and on the east by the Sea of Azof. The coast line, where it faces the Black Sea, is broken chiefly by the Gulf of Perekop on the north-west, Kalamita Bay on the west, and Kaffa Bay on the south-east; towards the Sea of Azof the coast-line is more broken, not only projecting a long and narrow belt of land called the Tongue of Arabat, between the Sea of Azof and a branch of it called the Putrid Sea, but also presenting along the shores of the latter sea a constant succession of indentations, which give it a very ragged appearance. Two minor peninsulas project on either side of the Crimea, the one jutting out in the north-west, between Kalamita Bay and the Gulf of Perekop, and the other stretching east, between Kaffa Bay in the Black Sea and Arabat Bay in the Sea of Azof, to the Straits of Kertch, separating it from the so-called Isle of Taman. This latter peninsula, now known as that of Kertch, was in ancient times the seat of a celebrated kingdom, inhabited originally by the Cimmerians, a people of whom many fables are told, and from whom the Straits of Kertch at their narrowest part bore for many ages the name of the Cimmerian Bosporus.

The surface of the Crimea presents two very different aspects. At least three-fourths of the whole peninsula belong to the region of steppes which occupies a vast extent of the south-east of Europe, and is continued far east into Asia. The Crimean steppe, while presenting the usual character of a monotonous, treeless flat, consists partly of saline tracts almost bordering on absolute sterility, and partly of pasture grounds varying in fertility, so as to yield in some parts only a scanty herbage, and in others luxuriant crops of grass, on which immense flocks of sheep and numerous herds of horses and cattle are fed. The other part of the peninsula, confined entirely to the south, and stretching, with a comparatively narrow breadth, along the coast from west to east, is a mountain land, beautifully diversified, and abounding in scenery of the most enchanting description. A mountain-range, which, in its more westerly portion, is called Yaila, stretches eastward from the neighbourhood of Sebastopol towards the Peninsula of Kertch for about 100 miles, and with a breadth, including both its northern and its southern slopes, of about 20 miles. This range, composed chiefly of Jura limestone, disturbed and penetrated in many places by granite, greenstone, and other igneous rocks, varies in height from 2000 to 5135 feet, the latter being its culminating point, which it attains in Tchadirdagh—a mountain of singularly picturesque form, which, towering at least 1000 feet above all the others, is seen at a great distance from all directions, and thus gives the general landscape one of its most distinctive features. The southern slope of the whole range, which, though sometimes 12, is often not 3 miles from the shore, is for the most part very abrupt, sometimes presenting a wall-face of more than 1000 feet in height, and forming ranges of cliffs, between the openings of which occasionally a good and deep anchorage is found. In this way, near its western terminus, the opening within which the celebrated harbour of Sebastopol is constructed, has originally been formed. As the slope descends it is intersected by numerous valleys, which, completely sheltered to the north and open on the south to the full rays of the sun, are admirably adapted for the culture of the vine, which is here almost of fabulous luxuriance, and so productive that, according to a very competent judge, the vineyards of this comparatively small district might, if under the best mode of management, yield nearly as much wine as is now consumed in all the countries of Europe which depend on foreign supply. To this culture, accordingly, which nature herself points out as the most expedient, the sunny hills and valleys of the southern slope are mostly appropriated; but many of the more delicate fruits are also grown, and plantations, both of olives and mulberries, are not uncommon.

The northern slope of the mountain range is for the most part gradual, descending almost by imperceptible degrees till it meets or becomes confounded with the steppe. As this debatable ground is approached a soil and climate well adapted for cereals is found; and corn, which does not fall much short of the whole annual consumption of the inhabitants, is raised. On this slope, however, more especially in its more sheltered valleys, the object of culture is fruit, which in its leading forms of plums, apples, and pears is grown in such abundance as to furnish a large and profitable export. One great drawback to successful cultivation in the Crimea is in the nature of its climate, which is subject to great and sudden transitions. Often in spring, when vegetation has considerably advanced, a severe frost or a storm of hail or snow disappoints all the hopes of the husbandman. Droughts also are long and severe; and the rich verdure, with a gay enamelling of flowers, which in the early part of the season delighted the eye even in many parts of the steppes becomes in summer withered and burned up. This want of moisture is felt not so much in the mountain district, where the limestone rocks, permeated by the melting snows which covered the mountains in winter, continue long after to furnish liberal supplies from their numerous veins and caverns, but produces irreparable injury in the steppes, which are not traversed by a single perennial stream except the Salghir. Even it, though the largest in the peninsula, is, contrary to the usual rule, most copiously supplied near its source, and, as it proceeds into the steppe, diminishes in volume so as to become insignificant before it reaches its mouth in the Putrid Sea. A few other streams claim notice, not for their magnitude, but for the historical celebrity which now attaches to them, and hence it would be unpardonable to leave unmentioned the Tchernaya, the Belbek, the Katcha, and, above all, the Alma.

The most important of the productions, in an economical point of view, have been already mentioned; but to make the enumeration more complete we ought to add to the cultivated plants tobacco, of which a large quantity of excellent quality is produced, and flax and hemp, which are only of secondary importance; and, to the uncultivated plants, thistles, so tall as to form thickets in which Cossacks are said to have concealed both themselves and their horses; wormwood of the same gigantic dimensions, and, notwithstanding its nauseous taste, sometimes consumed by cattle when better food has failed; mignonette in abundance, but, it is said, without the fragrance which cultivation has given to it; anemones, pinks, poppies, larkspurs, and other flowers in such profusion as literally to cover thousands of acres. The forests are of limited extent, and seldom contain magnificent timber. The most common kinds are the same as our own, but most of them are of stunted growth, owing partly to the havoc which has

been made among them for fuel, the supply of which is very deficient, and partly to the cankering teeth of the goats, which, though now removed from all forest grounds, were long permitted wantonly to prey upon them. Among domestic animals the first place is due to the sheep, of which there are large numbers of fine-woolled breeds; horned cattle and horses are also reared in large numbers. Of mineral productions the only one of consequence which the Crimea is yet known to possess is salt, which is obtained from lakes in the saline tracts already referred to, in large quantities, and furnishes the material of an active trade, chiefly with the interior, by land transport.

The Crimea being included in the Russian government of Taurida no separate returns are made of its population. It is estimated at from 300,000 to 400,000.

History.—The history of the Crimea extends over twenty-four centuries, commencing with the earliest annals of Greece and embracing the proudest periods of Roman history. While painted savages were roaming over our own island the Crimea had taken its place on the stage of the civilized world, was carrying on an extensive commerce, could boast of its cities and temples, and furnished events important enough to become the theme of tragedians and orators. As usual, its history commences with fable. The Argonauts, in search of the golden fleece, skim along its shores, and Ulysses, in his wanderings, not only visits the Cimmerians, its inhabitants, but enters one of its harbours, which Homer's description in the Odyssey has enabled some commentators, by the aid of a little fancy, to identify with Balaklava. At a still earlier period Iphigenia, doomed to perish by the rash vow of her father Agamemnon, is snatched away and carried to Tauris, to become the priestess of Diana Tauropolitana. Greek settlements now begin to be formed on the shores of the Crimea; cities are built—one of them Theodosia, which still retains its name—and kingdoms, which endure till many dynasties are exhausted, arise. Long after the period now referred to the Romans enter upon the scene, and some of the greatest warriors whom the mistress of the world ever produced find in the Crimea a fit arena on which to display their prowess. Pompey conquers Mithridates, who, driven from every other quarter, at last finds an asylum in the Crimea, till his favourite son betrays him, and he falls by his own hand, as if he thought life now no longer worth the having. The Bosporus, ceasing to exist as a separate kingdom, becomes a dependency on Rome, and its kings are mere puppets in the hands of its rulers. Ultimately, however, Rome herself begins to totter, and she falls a prey to barbarian hordes. All previous authority being thus in a manner abrogated, the settlements in the Crimea appear to have had a very precarious existence, at one time placing themselves under the protection of the Byzantine emperors, at another becoming the tributaries of some marauding adventurer, and at another claiming to be their own masters. Meanwhile a powerful race was advancing from the elevated plateau of Central Asia, and the ominous name of Turk began to be whispered in the court of the Greek emperors. The time when some offshoot from this race first arrived in the Crimea is not well ascertained, but in the seventh century the greater part of it was in the hands of a Turkish tribe called Khazars, and had, in consequence, changed its name to that of Khazaria. In like manner its southern coast, where the Goths had established themselves, was called Gothia. The Crimea formed only a minute portion of the territories of which the Khazars had made themselves masters. Their capital was seated near the mouths of the Volga, probably not far from the present Astrakhan, and their sovereigns, called Khazars or Khans, lived in a state of splendour which the monarchs of Western Europe have seldom equalled. In the tenth century the Russians and Pichengues come upon the scene, and before the end of it the power of the Khans is almost broken. The Russian conquests were made chiefly in the north; the Pichengues, on the contrary, make their incursions on the south; and the Crimea, though still retaining the name of Khazaria, is obliged to receive them as its masters. The Pichengues, after maintaining their footing for above a century and a half, were forced to give way to the Comanes, who themselves were, in fact, fleeing before a race much more powerful than either. This was the Mongol Tartars, headed by the celebrated conqueror Genghis-Khan. The Crimea having been included in his conquests, passed, on his death, to his grandson, Batu-Khan, and in 1240 was incorporated in the great empire of Kaptschak, or as it was also called, The Golden Horde. Batu-Khan is brought into more immediate connection with the history of the Crimea as the founder of Baktschi Serai, which continued long to be its capital. Mengli Timur, the second in succession from Batu-Khan, having granted the Crimea to a nephew, to be held as a dependency of the grand khanate, it took the name of Crim, or Little Tartary, from which that which it now bears is evidently derived. Previous to this time the Genoese had frequently visited its shores as traders, but they now applied to the under khan for permission to form a permanent settlement. This was granted, and they in consequence became, in 1280, the founders of Kaffa, which, being built on the site, is still known by its ancient name of Theodosia. The great object of the Genoese in making this settlement was to exercise a control over the extensive and lucrative trade which was then carried on with the East, by way of the Caspian Sea and the Volga, and thence, after a short land-carriage, down the Tanais or Don, into the Sea of Azof. This trade, and along with it another revolting to humanity—a trade in vast numbers of slaves, composed of the prisoners whom the grand khans captured in war, and sent down to Kaffa as the great slave mart—so increased the importance of this settlement that the Genoese, who had come as simple traders, began to aspire to be masters. The jealousy of their great rivals, the Venetians, was excited, and open hostilities were carried on, each party contending for an exclusive monopoly of the whole trade of the Black Sea. Other parties were not indifferent spectators of a contest where such a prize was in view. The Greeks of Constantinople felt more especially interested, as it had even been proposed to prohibit any vessel from sailing northwards beyond the mouths of the Danube without a licence. In this contest the Genoese, arrogant as their pretensions were, gained the advantage, and they continued to follow it up by forming permanent settlements, and erecting strong fortifications. In this way they obtained possession of Soldaia, now Soudak, in 1365, and about the same time made themselves masters of Cembalo, which afterwards exchanged its name for that of Balaklava. The old castles at both these places are Genoese.

While Genoa was thus a rising power, the khans were rapidly declining. To complete their downfall, the terrible Timur appeared, and early in the fifteenth century the great empire of Kaptschak or the Golden Horde was broken up into fragments. Early in the fifteenth century the Crimea thus became an independent khanate, and continued so to exist under the line of Gherai, descended from Genghis-Khan, for a succession of reigns. The Genoese in the meantime were growing in power, and suc-

ceeded, by interfering in a disputed succession, in gaining complete ascendency over the khanate. The Tartars, disliking their rule, applied to Mohammed II., sultan of Turkey, inviting his interference. The invitation was too tempting to be refused, and on the 1st of June, 1475, a Turkish fleet of 400 sail, carrying an army of 20,000 men, under the command of the celebrated vizier, Ahmed Pascha, appeared in the Bay of Kaffa. The Genoese offered an ineffectual resistance; and Kaffa, along with all their other settlements, were soon in the possession of the invaders, and the Crimea became a province of the Ottoman Empire. Khan Gherai, whose appointment by the Genoese had led to the destruction of the khanate as an independent sovereignty, was permitted to reign as a dependent of the sultan, and transmitted the succession to his family through many generations. The Turks, not satisfied with the Crimea, had extended their conquests far into Russia, and thus given rise to the grand struggle of which the Crimean War was only one of the phases. At first the Russians contended merely for existence. By-and-by they began to dream of conquest; at last they so completely established their ascendency that every new war was followed by an extension of territory. At length, in their progress southward, they reached the Isthmus of Perekop. The low sandy tract of which it consists had been rendered easily defensible by a series of lines drawn across it, the most important of which was a dry fosse 72 feet broad and 52 feet deep. Here the Russians arrived in 1736, with an army 50,000 strong, headed by Marshal Munich. After forcing the lines, or rather stealing through them by outwitting their Tartar defenders, Marshal Munich made his way southwards across the Crimea, till he reached the banks of the Alma. He found no human enemy able to cope with him, but encountered insuperable obstacles in the nature of the country through which he passed; and after making a barren conquest was glad to retrace his steps, with the loss of more than half his army. The contest for the Crimea, thus begun, was, like all Russian aggressions, steadily persisted in; and the conquest was virtually completed by the troops of Prince Dolgorouki in 1771. By the Treaty of Kainardji the Crimea nominally became an independent state under its ancient race of khans, but the moment the purpose of this delusive arrangement was served, the Russians found no difficulty in violating it. In 1783 the khanate, which had become a mere farce, was extinguished, and, by an ukase of the Empress Catherine, the Crimea was united to the Russian Empire.

The progress of Russia in this direction naturally held out to her more tempting objects of ambition, and it was generally believed by the western powers of Europe, who were jealous of the growth of her gigantic power, and particularly by England, of whose policy, in consequence of her possessions in the East, the preservation of the Turkish Empire had become a primary object, that she aimed at the dismemberment of that empire, and the conquest of Constantinople itself. Among other indications of aggressive tendencies, the great naval arsenal of Sebastopol, occupying the most commanding position in the Black Sea, at the extremity of the Crimean peninsula, begun by Catherine II. in 1786, was completed on a scale of which the world has yet seen few examples, and provided to an unlimited extent with all the means both of offensive and of defensive warfare. One main object of this arsenal undoubtedly was to hold out a standing menace against Turkey, and make her destruction certain whenever an opportune period for striking the final blow should have arrived. The Emperor Nicholas, one of the ablest as well as most ambitious of the czars who have ever swayed the Russian sceptre, had satisfied himself that this period was actually at hand. A new revolution had placed Louis Napoleon as emperor on the throne of France, 1st Dec. 1852, and the British government, distrusting his intentions, seemed almost on the eve of being involved in open hostilities with him. Thus the two most faithful allies of Turkey, and the only two states which had at once the strongest interest and the necessary means to defend her, appeared to be hopelessly divided. Meantime, in February, 1852, the Porte had given a decision on a dispute between the Latin and Greek Churches, the former protected by France, the latter by Russia, as to the protection of the *Holy Places* in Palestine, which was deemed favourable to Russia. A new demand, however, was made by this power, which, in November, claimed, in virtue of the Treaty of Kainardji, a protectorate over the Greek Church throughout the Turkish Empire. After complicated negotiations, for which the reader may be referred to the first volume of Kinglake's History, the Porte, under pressure from France, vacillated towards the side of the Latins, and on 22d Dec. delivered the key of the Church of Bethlehem to the Latin patriarch. The diplomacy of England, France, Russia, Austria, Prussia, and Turkey exhausted itself in negotiations over this dispute, and at length, in May, 1853, Prince Menschikoff delivered an ultimatum to the Porte, which being rejected, the Russian troops, which had been advanced to the Pruth at the close of the previous year, crossed it and occupied the Danubian principalities. The Porte declared war on 23d October, 1853; France on 27th, and England on 28th March, 1854. On 26th January, 1855, the allies were joined by Sardinia. Happily the common danger had dissipated all the misunderstandings which had arisen between Great Britain and France. Nicholas had selected the Danubian principalities as the scene of warfare, and here the allied army was first conveyed; but after remaining inactive for some time at Varna, it was determined that the Crimea should be made the great battle-field. Accordingly, in the beginning of September, 1854, the combined fleets of Britain and France, forming, perhaps, when efficiency as well as vastness are considered, the mightiest armament ever conveyed by sea, appeared off the west coast of the Crimea, about 30 miles north of Sebastopol. The disembarkation having been completed on the 16th, the army began to move southwards on the 19th, and early on the 20th approached the banks of the Alma. Here the Russian army was found occupying a position which Prince Menschikoff, its commander, believed to be unassailable, and which would, perhaps, have proved so to any other troops than those that were about to attack it. After a struggle, in which skill and courage worthy of the best days of British and French heroism were displayed, the Russians were forced to give way at every point, leaving the allies in possession of a victory which, under the name of the battle of the Alma, deserves, and is doubtless destined to hold, an honourable place in military annals. Two days after, the allied army continued its march for Sebastopol, the real object of attack; but for strategical reasons, instead of proceeding directly to the north side of the fortress, made a circuit which brought it considerably to the south, in the vicinity of Balaklava. This small harbour, near which the British were stationed, furnished them with facilities for landing the munitions of war, while the same object was gained, perhaps more advantageously, by the French at Kamiesch Bay.

It has been alleged that an assault upon Sebastopol, had it been made immediately after the victory of the Alma, would probably have been successful.

The defences were, towards the sea, justly deemed all but impregnable, but on the land side, from which the czar, in the pride of his heart, had never dreamed of the possibility of an attack, were very incomplete. The allies, however, doubting the success of an assault, resolved to proceed in more regular form; and thus commenced one of the most remarkable sieges of modern times. It is impossible here to enter into details. The utmost skill, courage, and perseverance appear to have been displayed both by the besiegers and the besieged. The latter were, however, in almost every respect the more favourably situated. Their munitions of war were almost unbounded; the northern side of the harbour was never invested, so that their communication with the country always remained open; and, contrary to the rule established in regard to siege operations, the number of troops within the town nearly equalled, and at one time greatly exceeded, the number of those who were attempting to take it. The consequence was that not only were defensive works constructed rapidly while the siege made comparatively little progress; but the besieged, who had also the assistance of an army without the walls, were able to assume the aggressive, and on the 5th of November made an attack, now known by the name of the battle of Inkermann, which was most valiantly repulsed. The prospects of the besiegers, however, immediately after it looked so gloomy that it was seriously proposed to abandon the siege, but happily the inglorious suggestion was rejected, and both Britain and France became more alive than they seemed previously to have been to the magnitude of the struggle in which they were engaged. While the siege continued to advance, other important positions in the Crimea were occupied, and the possession of Eupatoria on the west, and of Kertch on the east, both seriously threatened the communications of the Russians, and furnished the means of destroying a large portion of their supplies. The peninsula was thus virtually conquered, and a successful issue of the siege began to be confidently anticipated. At an early period the Russians, by sinking a number of large ships across the mouth of the harbour, had rid themselves of the danger of an attack by sea. The remainder of the fleet within the harbour was still available for defence, and, from its powers of locomotion enabling it to change its position so as to meet emergencies, was able greatly to retard the besiegers. Decided progress, however, continued to be made. On the 7th of June, 1855, the Mamelon, a commanding height, was taken; and on the 8th of September the flag of the allies waved on the tower of the Malakoff. The Russians, on the night of the above day, aware that further defence was impossible, withdrew to the northern side of the harbour, after sinking their ships and blowing up the defences of the town, which was now taken possession of by the allies. There is no reason to doubt that in another campaign the Russians might have been driven entirely out of the Crimea; but overtures of peace were made, and they gladly availed themselves of them. A treaty of peace was concluded at Paris on 27th April, 1856, by which the independence of the Ottoman Empire was guaranteed, and her admission to the society (*concert*) of European powers declared by the other contracting parties, namely, Great Britain, Austria, France, Prussia, Russia, and Sardinia; the Christians in Turkey to remain under the protection of the sultan, who, by a firman, allowed them religious liberty; the waters of the Black Sea declared neutral, and only light vessels for coast service allowed to be maintained there; the Emperor of Russia and the sultan not to maintain any military-maritime arsenal on the shores of the Black Sea. Taking advantage of the Franco-Prussian war, Russia, on 31st October, 1870, denounced the two last mentioned conditions of the Treaty of Paris, and has since restored the fortifications of Sebastopol.

CRIMINAL LAW. In no department of legal science do so many different views prevail among jurists, and in none have these views exercised so great an influence upon the theory and practice, as in this. The doctrine of the criminal law is that the individual committing an unlawful act must not only make amends to the party injured, but also be punished by the supreme authority of the state. The first question is, whether and how far the state is authorized to inflict punishment. This question cannot be decided by positive rules of law, because the object of the inquiry is to reconcile these rules with natural justice. States have indeed at all times exercised the power of punishment without waiting for or regarding such theoretical investigations, because it is obvious that, without the right of punishing, no state could exist. As a general principle, therefore, it must be admitted that the state has a right to inflict the punishment which tends most effectually to prevent the repetition of the crime, because in states as well as in individuals self-preservation is the primary law, and overrides all others. The different systems which have attempted to establish theoretically the right of punishment may be brought under the following heads:—

I. The system of *vengeance*.—From the opinion that he who has injured another cannot complain of injustice if a similar evil is inflicted upon himself, and the injured person, or, in case of murder, his family, would be disgraced if they did not obtain satisfaction, arises the rude system of retaliation which we meet with in so many nations; but whilst those who take revenge must beware not to exceed the measure of the injury received, lest they become aggressors in their turn, they will be obliged to adhere literally to the rule of 'an eye for an eye, a tooth for a tooth;' and in this state we find the criminal law subsisting among nations for a considerable time, and bloody revenge and retaliation become a common right and duty. (See Michaelis on the Mosaic Law.) In this state of things the punishment of offences against the law belongs not to the community but to the individual; and the public authority is active only in putting limits to the continual exercise of revenge, and in providing means for terminating the hostilities among families, which threaten the nation itself with destruction. From this arises the system of composition. Offences are estimated at certain rates in money; and not only is the offender forced to pay the sum fixed, but the offended party must also receive it in satisfaction. With this degree of progress is connected the idea of a national peace, which is developed in various forms and relations, as the peace of the king, the peace of the court, &c.; involving at the same time the acknowledgment of a public power, whose duty it is to protect and judge. We find the law of composition among the old Germans, as well as the nations of the Indian Archipelago and the tribes of American savages. The next step is the acknowledgment of the principle that the community is bound to prevent crimes. The right of revenge passes into the hands of the state, which does not wait for the complaint of the offended party, but takes upon itself the duty of the accuser. The theory which next succeeds is,

II. The system of *deterring*.—By the punishment of the offender others are to be deterred from similar acts. The punishment is therefore inflicted publicly; and the more horrible the crime the greater effort

is made to confirm the popular abhorrence of it by severe penalties. This system is liable to the most weighty objections. It cannot be allowable to torment or put to death a human being simply with the view that others may receive from his sufferings such an impression as to be proof against the temptation to commit crime. In point of fact this end has never been attained, and would require a scale of punishments offensive to sound reason. The mere fear of punishment is of very little weight. Men are kept from crime principally by the natural abhorrence of wrong, heightened by a good education and good example. If the plan of deterring should be carried through consistently it would compel us to proportion punishment rather to the temptation to commit crimes than to their magnitude. (See Feuerbach's Revision der Grundsätze des peinlichen Rechts, Erfurt, 1799—Revision of the Principles of Penal Law.) With regard to capital punishments, more particularly, the system of deterring fell by degrees into disrepute after the Marquis Beccaria (On Crimes and Punishments, London, 1770) and a great many other learned men had declared themselves against it.

III. The system of *prevention*, which is ingeniously defended by the Hessian minister Von Grolman (Grundsätze der Criminalrechts Wissenschaften, Giessen, 1798—Principles of the Science of Criminal Law). Every crime contains, if man is considered as a consistent being, the expression of a principle of conduct, and accordingly, besides the present transgression of the law, a threat of a repetition of the offence. The community is therefore entitled to take measures of prevention against it, which, if the injury done is irreparable, may extend to the deprivation of life. This system may be said to afford the true reason for punishment in general. It may, however, be objected to it that this provision against future crimes is not really punishment, and that the punishment must needs be omitted if this presumption of the future offences is refuted by the particular circumstances of the case. This principle, moreover, admits of no scale of punishment, because the means of effectual prevention must always be the same—death or imprisonment for life. The direction which the science of natural law had taken at this period, seeking for the foundation of every right in a contract, led to—

IV. The system of *compact*, which asserts that by becoming a member of the state every individual has, by tacit compact, bound himself to submit to punishment if the society choose to inflict it. As, however, no one can be bound by a contract to anything which is not right in itself, the lawfulness of punishment cannot be shown in this manner. Fichte, therefore, in his original way, modified this theory. He proceeded upon the principle that, by trespassing upon the right of others, the criminal deprived himself of the claim to be treated as a rational being, since the rights of a free agent depend on his respect for those of others. Every crime, therefore, he says, justifies the expulsion of the offender from human society. The compact by which the punishment is determined is consequently in favour of those who receive a lighter punishment than such expulsion. They acquire a right, by suffering some determined evil, to be admitted again into civil society. Much of this theory is true, but the real existence of such a compact seems to be wanting.

V. At the same time the theory of *atonement* was introduced by Klein and others. The criminal does injury in two ways: 1, to the person who is the immediate subject of the wrong, for which he has to make him amends according to the rules of private law; and 2, by the bad example afforded by the diminished respect for the laws of the state, for which he is answerable to the community. This latter injury is compensated by the punishment, which vindicates the authority of the law in the minds of the people. This theory has in later times been further developed with great ingenuity by Schultz.

VI. The theory of *psychological constraint*, by Feuerbach, is founded upon the system of deterring, with the addition of this position—that the threatening of punishment, in general, is lawful, because it forbids no one to do anything which he can have a right to do; and this menace renders punishment lawful in case of an offence occurring, because the individual knew beforehand what he had to expect. This theory is exposed to most of the objections against the theory of deterring, and the grounds on which it rests often fail in particular cases.

VII. The principle of *moral correction* has been little used as the basis of the right to punish. It has for its end to correct by punishment, in the criminal himself, those unlawful propensities which impelled him to crime. It is undeniably correct so far as this, that the punishment ought never to be such as to make the moral correction of the criminal impossible, by the annihilation of his sense of honour, by exposing him to corruption in the society of other criminals, and destroying his ability to support himself in an honest manner. But it is evident, on the other hand, that the sentiments of men and their moral reformation cannot be the direct object of legislation, from the very circumstance that this effect is not of a kind to be ascertained; but to produce an outward habit (for instance, to dispose the idle to labour, the drunkard to sobriety, &c.) is practicable.

Finally, VIII. The theory of *retaliation* has been adopted, since the time of Kant, by almost all the German philosophers, but, at the same time, by very few lawyers. It is founded upon the principles, that the state ought to suffer no wrong within itself; that every unlawful action ought to be annihilated, and is annihilated, when made to revert on the author; and that the latter suffers no injustice by being treated in the same way as he has treated others. This retaliation is not, however, a literal one. It inflicts not the same evil on the criminal which he has done to another; but it seeks for a generic notion of the offence, and applies, according to this, the principle of the criminal against himself. This affords, at the same time, a measure for punishment which no other principle of penal law affords, though it still requires that the degree of punishment, in particular cases, should be fixed by positive law.

We have thus set forth the theories on the subject of criminal legislation. In no branch of law has legislation been at all times so active as in this. The influence of theory has extended even to the forms of process, and the civilization of nations always manifests itself early by the improvement of the criminal law. Criminal law was first treated scientifically in Italy, but remained in a very rude state till the middle of the sixteenth century. The dreadful abuses in the administration of criminal justice in Germany and France gave occasion to the two great reforms introduced by the penal code of Charles V. of 1532, and the criminal ordinance of Francis I. of 1539. This branch of jurisprudence now assumed a more systematic character. The ordinance of Charles V. greatly improved the forms of process, but retained, according to the spirit of the times, cruel punishments, and even torture. Of the points of criminal law, which, in recent times, have given rise to much diversity of opinion, the following are of particular practical importance:—1. The right of punishing flagrant crimes without the authority of

an express law. Those who acknowledge the authority of a natural law affirm the existence of such a right, and divide criminal actions into those which are bad in themselves (*delicta juris naturalis*), or as the English law terms them, *mala in se*, and actions which are of themselves indifferent, but are subjected to a penalty by particular laws (*delicta juris positivi*), or as the English law terms them, *mala prohibita*. Crimes of the first class, as murder, theft, &c., must be everywhere punished, even without a positive law; but those of the second, as contraband trade, are punishable only when made penal by express enactment. Feuerbach and others, however, acknowledge no right of punishment without an express law. 2. With the preceding is nearly connected the question —how far it is the right or duty of the state to punish crimes which have been committed in foreign countries. On this point, in addition to the difficulties attending the main question, there exists a great difference of opinion as to the laws by which such crimes are to be judged, whether by the laws of the foreign country, or of that to which the individual belongs. 3. What power should be given to the judge to vary the punishment according to the different circumstances attending the offence? The tendency, in modern times, is to define crimes and their punishments so exactly as to leave nothing to the discretion of the judge, and to enable every man to see what he has to expect from a violation of the law. It is doubtful whether so much precision is generally advantageous, since it almost necessarily produces an unequal distribution of punishment, the question whether it shall be light or severe frequently depending on a little difference in the age of the offender, the amount of property stolen, &c.; so that a penny more or less may make a difference of several years' confinement in a penitentiary; or the difference of a day, in the age of the culprit, may decide whether he shall be punished with a few stripes, or deprived of his liberty for years, or of his life. 4. One of the most difficult points is the just estimation of injuries done to the honour of another, which involves the great question of the liberty of the press. The most important differences of opinion, however, are those which prevail with regard to criminal process. From the representation given above of the principles and the development of penal law, it is evident that criminal proceedings have always been founded at first upon private accusations, in regard to which almost the same principles prevail as those observed in civil actions. In the course of time this mode is superseded by a public accusation on the part of the state appearing by an attorney to prosecute the offence. Upon this principle are founded the criminal proceedings of the English courts, and of the French courts since the revolution. With this may be united the public trial by jury, which has found so many adherents in modern times. Its fundamental character consists in this, that the party accused remains merely passive, and waits for the charge to be proved. The consequence is, that the sentence must be pronounced from a view of probabilities, and depends, therefore, more on a knowledge of men, and the deductions of a sound judgment, that on technical rules. It has been considered the safest mode of trying offences, in particular, as it prevents the dangers arising from the influence of the higher officers of the state over judges deriving their salaries from the sovereign, by referring the question of guilt or innocence to the verdict of men taken immediately from among the people, that is, jurors. The German criminal proceedings are directed principally, it may be said solely, to the end of obtaining from the accused a confession of the deed, and of its circumstances, by inquisitory process. This admits neither of an accuser nor of a public trial, but the judge must inquire of the accused himself, and obtain from him, if possible, by a skilful combination of the circumstances, as well as by awakening the voice of conscience, complete truth. What is in Germany the chief business of the judge belongs in France to the *juge d'instruction*, and in England to justices of the peace, or other magistrates whose inquiries afford, in common cases, the materials for the final trial. The opponents of the trial by jury allege, as a chief reason for their opposition, that when the preparatory process affords no certain results, the subsequent trial is attended by the same uncertainty.

To the above we have to add a few suggestions growing out of the practice of the common law, which constitutes the basis of the institutions of England. The general theory of the common law is, that all wrongs are divisible into two species: first, civil or private wrongs; secondly, criminal or public wrongs. The former are to be redressed by private suits, or remedies instituted by the parties injured. The latter are redressed by the state, acting in its sovereign capacity. The general description of the private wrongs is, that they comprehend those injuries which affect the rights and property of the individual, and terminate there; that of public wrongs or offences is, that they comprehend such acts as injure, not merely individuals, but the community at large, by endangering the peace, the comfort, the good order, the policy, and even the existence of society. The exact boundaries between these classes are not, perhaps, always easy to be discerned, even in theory; for there are few private wrongs which may not and do not exert an influence beyond the individual whom they directly injure. In doubtful cases the legislature usually interferes, and prescribes a positive rule. In clear cases the right of punishment on the part of the state is assumed as a deduction from natural justice, and the duty of the state to protect all its subjects. Hence in the common law two classes of offences are distinctly traced out. The first embraces those which rest upon legislative enactments. The second embraces those which, independently of any such enactment, are deemed, from their very nature, injuries to the public. The offences belonging to this last class are not, perhaps, capable of a perfect enumeration; and the test by which they are ascertained is left to the judgment of judges as cases arise, to be fixed, not according to their own discretion, but by analogy and appreciation of the principles and cases already well settled by former adjudications. When, therefore, a non-enumerated wrong arises which does not fall under any known former rule, the question which is discussed is, how far it falls under the principles already established respecting public crimes. If reasoning furnishes a strong analogy, it is deemed a public offence; if otherwise, it is left for the legislature to declare that it shall be such. Treason, murder, setting fire to a dwelling-house in a large city, riots disturbing the general peace, poisoning public wells, &c., it will be readily admitted, naturally endanger the good order and safety of the state, and therefore are properly to be punished by the state. But it is not so easy to trace the same principle in mere secret thefts, or a private fight, and yet deny its existence in violent seizures of private property, and private quarrels producing defamation of character. The common law considers the great object of the public punishment of crimes to be the prevention of offences by deterring both the offender and others from a repetition of the same. Its object is not so much an atonement for, or expiation of, the offences, as a precaution against their recurrence. This naturally includes, not as a primary motive, but as an incident, the reformation

of the criminal himself; for, so far as that is effected, it prevents offences. That system of punishments is indeed most desirable which attains its object by such a reformation. But it is obvious, that reformation cannot always be relied upon as sufficient security for society. Hence arises the necessity or policy of capital punishment, which, by cutting off the offender, not only operates as a terror to others, but secures society against the possible perpetration of the same offence by him. Undoubtedly it ought never to be resorted to except in cases of atrocious guilt, and where less punishments are manifestly inadequate to produce security. Some persons, indeed, doubt the lawfulness of capital punishment altogether; but the divine law has certainly sanctioned it. Others, who do not question its lawfulness, doubt or deny its policy. It is certain that the frequency of capital punishment has some tendency to abate its terrors; and it is by no means as certain that capital punishments have a tendency to prevent the occurrence of the crime, or to secure a conviction. There is a natural repugnance to punish, with so much severity, slight offences; and judges and juries, as well as the public, under such circumstances, lean against prosecutions and in favour of acquittals. Hence the probability of conviction is sometimes in proportion to the moderation of punishments. On the other hand, it is found by experience that the punishment of death is not sufficient to deter men from the commission of offences to which they are strongly tempted by their passions or their wants. The tendency of modern legislation has, therefore, almost uniformly been in favour of relaxing the severity of the penal code.

In Britain capital punishments were very extensively provided for by statute (4 Bl. Comm. 18), but recent legislation has greatly diminished the number, and treason and murder are now the only crimes punished capitally. In the United States of America there has been a constant effort to diminish the number of capital offences. There are but nine in the criminal code of the United States (see CAPITAL PUNISHMENT). In the United States no capital punishments are inflicted unless by the injunctions of some positive statute. In England the same rule prevails to a limited extent. A few offences were punished by the common law with death, without any statute to direct it, founded either upon the notion of conformity to the divine law, or upon some positive law whose existence cannot now be traced. Such were murder, rape, robbery, burglary, and certain other felonies at the common law. In respect to other offences for which no statute has prescribed any punishment, the general rule of the common law is, that they are punishable by fine or imprisonment, or by both.

Considering the infinite variety of circumstances which may occur to extenuate or aggravate the offence, not only the common law, but the legislature has left much of the degree of punishment to the discretion of the judges who try the case. That discretion must be exercised in public; and experience has proved that it is, on the whole, wiser and safer to leave it to the natural operations of judicial responsibility, than, by any attempts to define and limit the exact degree of punishment, to run the hazard of introducing other mischiefs by excluding mercy where it might be most desirable. No code of laws could be sufficiently minute to embrace all circumstances; and none could, therefore, provide for a perfect uniformity of punishments according to the absolute nature of the offence. Another inquiry is, Who are, in a legal sense, capable of committing crimes so as to be amenable to punishment? The general rule of the common law is, that all persons are punishable for disobedience to, and infractions of the law. The exceptions are few, and are clearly defined. They are such as presuppose a defect of reason and understanding, or of intention. A defect of understanding exists in the case of injuries committed by persons in a state of infancy, lunacy, idiocy, or intoxication. A defect of intention exists in the case of offences committed by chance, mistake, and ignorance, wholly without or against the intention of the party. In respect to want of capacity, idiots, madmen, and other persons not at the time in possession of reason, such as somnambulists, are generally excused, whatever injuries they may commit. But the common law does not extend this indulgence to crimes committed by persons who are in a state of voluntary intoxication. It considers this circumstance rather in the light of an aggravation of the offence. But a distinction is here to be made. If the party be at the time of the offence drunk by the use of strong liquors, he is punishable, though he may be thereby reduced at the time to a state of insanity. But if drunkenness be only the remote cause of the insanity, and the party be not at the time under the influence of intoxicating liquors, the law treats his case like that of any other insane person. It does not look back to the original and remote cause of the insanity. to ascertain whether it has been produced by criminal indulgence or neglect of duty, but to the immediate and operating cause at the time when the crime is committed. The exception, therefore, of the case of insanity by immediate intoxication, is carved out of the general exception in favour of insanity, and arises from, or at least is countenanced by motives of public policy, to prevent the dangerous effects arising from indulgence in strong liquors. The common law is, in this particular, more severe than the civil law. The latter never punished capitally for an offence committed under such circumstances. (4 Bl. Comm. 26.)

As to crimes committed by infants. There are various ages of infancy in the common law for different purposes. The general age of majority for all purposes is, in our law, twenty-one years; in the civil law, twenty-five years. Children under seven years of age are deemed without discretion, and are universally exempted by our law from punishment. Between seven and fourteen years they are said to be in a dubious stage, in point of discretion. If they, in fact, possess it, if they appear to have judgment and understanding, and a sense of crime, they are liable to punishment; otherwise not. Generally, the rule of presumption is in favour of mercy, that an infant under fourteen is *doli incapax;* but this presumption may be removed by facts establishing a clear sense of the difference between good and evil, together with malice and superior cunning. (4 Bl. Comm. 22, 23.) However, it deserves consideration whether this is a sufficient test of rational discernment of the nature of crime and duty; and judges may well lean against convictions in such cases, upon principles not merely of humanity, but of philosophical responsibility. After fourteen the general presumption is in favour of an infant being *doli capax*, and therefore he generally stands upon grounds similar to those of adults, until his actual incapacity is proved.

As to crimes committed by lunatics and idiots, the exception on account of want of capacity obviously applies only to cases where it exists at the time of the commission of the offence. Hence it is no excuse if a person who has been insane commits an offence in a lucid interval, or at a time when his reason is clearly restored. So, on the other hand, a person may not be an absolute idiot, so as to have no discernment whatsoever, and yet may be excusable from punishment if his capacity be so weak that he

does not, though an adult, understand clearly the distinctions between right and wrong. Extreme old age sometimes reduces persons to a state almost of fatuity, and exposes them to be imposed upon, and even seduced to the commission of offences, under circumstances where they would be held no more liable to punishment than infants. Everything depends upon soundness of mind and real discretion at the time of committing the offence. When a person becomes insane after the commission of an offence, and before trial, he is not, by the common law, ever allowed to be brought to trial until he is restored to his reason. At whatever stage of a public prosecution the insanity occurs, it operates as a suspension of all further proceedings. Thus, if it occurs before arraignment, the party ought not to be arraigned for the offence; if after arraignment, he ought not to be required to plead; if after plea, he ought not to be put to trial; if after trial, he ought not to have judgment or sentence pronounced against him; if after judgment, execution of the sentence ought to be stayed. The ground upon which this rule of law is commonly supposed to stand is, that it ought never to be presumed that the party, if sane, might not suggest some defence that, in reason or justice, would entitle him to mercy, or to exemption from punishment. A reason quite as satisfactory is, that the punishment of an insane person can produce no good result, either to reform the offender or as a public example. It would shock all the feelings of humanity to inflict punishment on those whom the visitation of Providence had already made objects of wretchedness and of compassion. In all cases where it is doubtful whether the party be insane or not, the fact is, by the common law, to be tried by a jury.

In respect to injuries committed without the intention of the party, as through misfortune or chance. Where an accidental mischief happens in the performance of a lawful act, in the doing of which the party uses reasonable care and diligence, he is wholly free from guilt, and it is deemed his misfortune; but if he does not use reasonable care and diligence, he is liable to punishment according to the nature and extent of his negligence. If guilty of gross negligence, he is sometimes punishable in the same manner as if the act were intentionally committed; if guilty of slight negligence only, he escapes with a more moderate punishment. If the mischief happen in the performance of an unlawful act, and a consequence ensues which was not intended or foreseen, the party is not free from guilt. But the degree of punishment ought to depend upon the nature of the unlawful act itself. A distinction is taken in the common law between cases where the original act is wrong and unlawful in itself (*malum per se*), and where it is merely prohibited by statute (*malum prohibitum*). In the former case the party is responsible for all incidental consequences of the unlawful act; in the latter not. An illustration of these principles may be found in cases commonly put in our treatises on criminal law: If a man be at work with a hatchet, and the head flies off and kills a standerby, this is not any offence, for the party was doing a lawful act without any intention of hurt. So a parent may moderately correct a child, and if in so doing death happens against his intention, it is mere misadventure. But if he corrects the child immoderately, or uses an instrument which is dangerous to life, or is wanting in reasonable caution, he is guilty either of manslaughter or murder, according to the circumstances and the degree of the punishment. If a man riding a horse with reasonable care accidentally runs over a child and kills him, he is not guilty of any offence. If he rides him furiously in a street where there may be danger, and the like mischief happens, he is guilty of manslaughter at least. If he rides him furiously into a crowd, either from wantonness or thoughtlessness, and the like accident happens, it will be murder. If a person in England duly qualified by law to kill game accidentally kills another while so doing, he is guilty of no offence. If a person be prohibited by statute from killing game, and the like accident happens by his shooting, he is not answerable in any other manner than a person duly qualified. This last case illustrates the distinction as to cases of *malum prohibitum*. On the other hand, if a person shooting at poultry belonging to another person, by accident kills a man, if his intention was to steal the poultry, it will be murder by reason of the felonious intent: if his intention was not to steal, but it was an act of mere wantonness, it will be manslaughter only. In these last cases the act is *malum in se*.

In respect to injuries committed through ignorance or mistake. This may arise when a man, intending to do a lawful act, does what is unlawful. An illustration commonly put is that of a man intending to kill a thief or housebreaker, in his own house, who, by mistake, kills one of his own family. In this case, if he acted under circumstances of reasonable belief that the party killed was the thief or housebreaker, there is no ground to impute criminality to him. His conduct was founded in a mistake of fact, that is, of the person; for it is sometimes lawful, by the common law, to kill a housebreaker found in your house. But a mistake or ignorance of law will not justify an act of the like nature. If a person supposes he has a right to kill a trespasser or outlaw, or excommunicated person, and he does so, he is guilty of murder.

In respect to crimes committed by compulsion or force. The common law recognizes but few cases in which the authority or command of a superior furnishes any excuse for the commission of an offence. In the case of children or servants the commands of the master or parent furnish no excuse. When a wife commits a crime in company with her husband, she is deemed, by the benignity of the law of this country and the United States, to act under compulsion, and therefore she is excused in all cases except murder and treason. These exceptions are founded upon the peculiar danger and atrocity of the offences, and the public policy of discouraging every motive to commit them. Where the wife commits the offence alone, without the company or compulsion of her husband, she is personally responsible in the same manner as if she were unmarried. There are other species of compulsion recognized in the common law which may excuse the commission of offences. Thus where a person commits an offence in consequence of threats or menace, which induce a fear of death or other bodily harm. This is called *duress per minas*. But the fear which compels a man to do an illegal act must be just and well grounded, such as may intimidate a firm and resolute man, and not merely of such a nature as may operate upon the timid and irresolute, otherwise it will constitute no excuse. Thus in time of war or rebellion a man may be excused for doing treasonable acts if they are caused by the compulsion of the enemy or of the rebels. But the compulsion must not be a mere threat to do injury to property, nor even slight injury to the person, but a just fear either of death or of great bodily injury; and even in such case it is the duty of the party to avoid doing such acts as soon as he safely may, by escape or otherwise, for if he does not he will be liable to punishment as a volunteer. But even this excuse is not allowed in all cases, but seems principally confined to crimes positively created by society; for no man can justify or excuse himself for

murdering an innocent person under the pretence of fear or necessity, though he certainly may kill another in necessary self-defence. Another case of compulsion or necessity often occurs in the reasoning of speculative writers, whether a person in extreme want of food is excusable for stealing to satisfy his hunger. Whatever may be the doctrine of foreign jurists, or the opinion of publicists, it is certain that no such excuse is now admitted in the common law. If the offence should be committed under circumstances of extraordinary suffering, the case would rarely be brought before any tribunal of justice; and if it should be, the power of pardon in the government, and the humanity of the court itself, would either annul or mitigate the punishment. There is another case often put, where two persons at sea are shipwrecked and get on a single plank, and it cannot support both, but both must be drowned unless one is displaced: what is then to be done? In such a case the law of self-preservation has been supposed to justify either party in a forcible dispossession of the other. The common law seems to recognize this principle, and in such a deplorable calamity imputes no blame to the survivor.

We now proceed to notice another important distinction which the common law acts upon in relation to crimes. It is the distinction in guilt and punishment which is made between principals and accessories. Persons are called *principals in the first degree* who are the actors or perpetrators of the offence. Persons who are present aiding and abetting the perpetrator are called *principals in the second degree*. This presence may be either in fact, as where the parties are immediately standing by, or are within sight and hearing; or constructive, as when the party, though not within sight or hearing, is on the watch at a convenient distance, ready to assist, and near enough to do so if required. There are cases too in which a person may be the principal in construction of law although he is absent, and the fact is done through the instrumentality of another; as in case of murder by poisoning a man may be the principal felon by preparing or laying the poison with an intention that it should be taken, or by employing an innocent person to administer it under false pretences, although he is not personally present when it is taken or administered. Many cases of the like nature may be easily put. An *accessory* is he who is not the chief actor in the offence, nor present at its perpetration in the sense above stated, but who is in some manner concerned in it either before or after the fact is committed. If he procures, counsels, abets, or commands the crime, and is absent at its commission, he is deemed an accessory *before* the fact. If, without any such participation in it, he knows that the crime has been committed, and afterwards relieves, assists, comforts, or receives the offender, he is deemed an accessory *after* the fact. Thus, if he aids the offender to escape, or rescues him from arrest, or conceals or supports him, he is deemed an accessory after the fact; so if he buys or receives stolen goods, knowing them to be stolen. There are certain classes of offences at the common law which admit of no accessories. Thus in treason all the parties concerned are deemed principals *propter odium delicti;* and in offences which are under the degree of felony, and in trespasses, all persons concerned are deemed principals for an opposite reason, because the law will not condescend in petty crimes to ascertain the different degrees of guilt. In all other offences, that is, in all except the highest and the lowest, there may be, technically speaking, accessories. It follows as a maxim that in such cases the accessory cannot be guilty of a higher offence than his principal. In respect to punishment the ancient common law did not make any distinction between accessories and principals; but by statute many distinctions are now made, and especially regarding accessories after the fact. There are in fact many reasons which require the distinction between principals and accessories to be constantly kept in view. In the first place, in many instances a man cannot be tried as accessory until after the trial and conviction of the principal. In the next place, if a man be indicted as accessory and acquitted, he may still be indicted as principal. In the third place, as a natural inference from the other considerations, the defence of the accused may, and often must, turn upon very different principles, where he is accused as accessory, from what might or could arise if he were accused as principal.

In respect to the mode of presentment and trial for offences. In England no person can be brought to trial for any capital offence or felony except upon the presentment or indictment of a grand-jury; but for inferior offences or misdemeanours an information in the nature of an indictment may be filed by the king's attorney-general or other proper officer, upon which the party may be put upon trial. Even in such cases an indictment also lies. In America informations are rarely resorted to in any of the states in such cases; and the usual, and in many cases the only constitutional course is an indictment by a grand-jury. All offences, whether charged by indictment or information, are, by the common law, to be tried by a jury composed of twelve men, and their verdict is conclusive upon the facts. In the United States this privilege of trial by jury is generally secured by the constitutions of the state and national governments. A privilege often quite as valuable to the accused is that of being assisted by counsel in the management of his defence. A curious anomaly in English jurisprudence—denying the accused the privilege of counsel in all capital cases—has properly been abolished.

CRIMMITSCHAU, or KRIMMITZSCHAU, a busy manufacturing town of Saxony, circle Zwickau, on the railway to and nearly 40 miles south of Leipzig, on both sides of the Pleisse, with 15,280 inhabitants. Brewing was formerly the most important industry of the place, but it now ranks far below the woollen and cotton manufactures, in connection with which are spinning and weaving factories, dye-works, machine-works, &c. The products of these manufactures are exported to the rest of Germany, Poland, Italy, Sweden, and even England.

CRINOLINE (French, from Latin *crinis*, hair), properly a kind of fabric made chiefly of horse-hair, but now generally applied to a kind of petticoat supported by steel hoops, and intended to distend or give a certain set to the skirt of a lady's dress. Hooped skirts are by no means a new invention of fashion, a somewhat similar monstrosity, supported by whalebone, being worn in the time of Queen Elizabeth and James I., and the fashion being again introduced in the time of George II. The earlier hooped petticoats were called *fardingales* or *farthingales*, and the difference between them and those of the era of the Spectator are thus expressed by Sir Roger de Coverley:—'You see, sir, my great-great-grandmother has on the new-fashioned petticoat, except that the modern is gathered at the waist; my grandmother appears as if she stood in a large drum, whereas the ladies now walk as if they were in a go-cart.' The petticoat characterized by Sir Roger as the 'large drum' was the farthingale of the time of James I. in its more exaggerated form. The crinoline proper came in about 1856, and was worn by women of all ranks, and sometimes reached portentous dimensions, so as to be not only very inconvenient to the wearer

and all coming in contact with her, but also the cause of accidents from fire, &c. Petticoats of the same construction are still worn, but the immense bell-shaped crinolines have happily disappeared, though their disappearance is certainly not to be attributed to the ridicule cast upon them by the male portion of mankind.

CRISIS (from the Greek *krinein*, to decide), in medicine, a point in a disease at which a decided change for the better or the worse takes place. The crisis is most strongly marked in the case of acute diseases and with strong patients, particularly if the course of the disease is not checked by energetic treatment. At the approach of a crisis the disease appears to take a more violent character, and the disturbance of the system reaches the highest point. If the change is for the better the violent symptoms cease with a copious perspiration, or some other discharge from the system. In cases where the discharge may have been too violent, and the nobler organs have been greatly deranged, or where the constitution is too weak to resist the disease, the patient's condition becomes worse. In regular fevers the crisis takes place on regular days, which are called *critical days* (the 7th, 14th, and 21st); sometimes, however, a little sooner or later, according to the climate and the constitution of the patient. A bad turn often produces a crisis somewhat sooner. When the turn is favourable the crisis frequently occurs a little later. After a salutary crisis the patient feels himself relieved, and the dangerous symptoms cease.—It hardly need be mentioned that the word *crisis* is figuratively used for a decisive point in any important affair or business; for instance, in politics.

CRISPIN and his brother CRISPINIAN, the names of two legendary saints, whose festival is celebrated on the 25th of October. They are said to have been born at Rome of a family of rank, and to have fled from that city to Gaul about the middle of the third century A.D., where they propagated the Christian religion, and died as martyrs about 287. During their mission they maintained themselves by shoemaking; hence they are the patrons of shoemakers. According to the legend the benevolence of St. Crispin was so great that he stole leather in order to make shoes for the poor!

CRITICAL PHILOSOPHY. See KANT and PHILOSOPHY.

CRITICAL POINT OF TEMPERATURE, a term introduced by Andrews in describing his remarkable discovery of a particular point of temperature at and above which it is impossible to convert gases into a truly liquid form by the application of pressure. (See MATTER, CONTINUITY OF LIQUID, AND GASEOUS STATES OF.) The temperature of the critical point differs with different substances; but for each body it is invariable. In the case of carbonic acid gas, which has been so carefully studied by Andrews, it is placed at 30°·92 Cent. It is now considered that those gases, such as hydrogen, nitrogen, and oxygen, which have hitherto resisted liquefaction under the joint application of the greatest cold and pressure that we can at present apply, have their critical point so low that none of our present freezing-mixtures can reach it.

CROATIA, a country in the south of Europe, belonging partly to the Turkish, but chiefly to the Austrian monarchy.—TURKISH CROATIA, forming the north-west extremity of Turkey in Europe, is properly included in Bosnia. Its leading features are the same as those of Bosnia (which see).—AUSTRIAN CROATIA forms, along with Slavonia, a crown-land or province of the Austrian dominions, being included in the Transleithan or Hungarian portion of the monarchy. The province is bounded N. by Styria and Hungary, E. and S. by the Military Frontiers, W. by the Adriatic, Carniola, and Styria; and has a total area of 8863 square miles, and a population of 1,150,153. Croatia Proper occupies an area of about 3800 square miles, and has a population of 757,477. It is covered with mountains, forming a continuation of the Julian Alps, and attaining their culminating point of 4400 feet in the Velika Viozochicza. In the north a small branch of the Carnic Alps forms the watershed between the Drave and the Save. To these two rivers, particularly the latter, the whole drainage belongs, being received either directly or by the Mur, a tributary of the former, and by the Kulpa and Unna, tributaries of the latter. In the north, on low sunny slopes, the vine is successfully cultivated; the olive, mulberry, and fig thrive well on the coast. The south is generally unfertile, and in many parts almost sterile. The principal crops are barley and oats; and, owing to the ruggedness of the surface, the whole country is more pastoral than arable. The inhabitants are Croats, and Raitzes or Serbs, with a mixture of Germans, Hungarians, Jews, and Gipsies. They are mostly bigoted Catholics, and are immediately governed by a ban. The chief towns are Agram, Warasdin, and Karlstadt.

Croatia was anciently inhabited by the Pannonians, who were subdued by the Romans under Augustus. In A.D. 489 it was taken possession of by the Goths, and in A.D. 640 the Croats, a tribe from Bohemia, settled in it, and gave their name to the country. In the tenth century its princes assumed the title of Kings of Croatia, which they subsequently changed into that of Kings of Dalmatia. About the end of the twelfth century it was incorporated with Hungary, and thenceforth sent representatives to the diet; but retained, and still retains, many of its peculiar political rights and privileges.

CROCIN, a colouring matter obtained from the fruit of *Gardenia grandiflora*, Chinese yellow pods, *hoang-tchy*, which is largely used in China for dyeing silk, wool, and other fabrics yellow. The colour is extracted from the pods by a complex process, and forms a red powder, which is soluble in water and in spirit. By dilute acids it is decomposed into *crocetin*, which also by proper treatment dyes a fine yellow. Crocin has been identified with an analogous body obtained from saffron (which see).

CROCODILE. The crocodiles (*Crocodilia*) form an order of saurian or lizard-like reptiles, species of which are found in the Old and New Worlds; and the name crocodile (*Crocodilus*) is also given to a genus of the family Crocodilidæ, belonging to this order. The crocodile inhabiting the Nile and other rivers of Africa has been known for many ages, and celebrated from the remotest antiquity for qualities which render it terrible to mankind. As the largest existing reptile, and as the most ferocious and destructive of the inhabitants of the waters, it could not but command the attention and excite the fears of those who were near enough to observe its peculiarities. Few persons have read the sublime book of Job without being struck with the magnificent and terrible description of the attributes of leviathan, to which alone the characters of the crocodile correspond. It is not surprising that the Egyptians, who deified almost everything, should place among their gods animals so powerful and destructive, though a better reason is to be found in the defence which they afforded against the incursions of Arabs and other robbers, who were not fond of adventuring across canals and rivers frequented by crocodiles. A regular priesthood and worship were consecrated to this ferocious deity, and in the temple of Memphis a sacred individual of the species was reared with great care,

being abundantly fed, adorned with jewels, and lodged in a spacious basin, having offerings and sacrifices made to him. Being thus fed and managed, the terrible reptile became sufficiently mild and tractable to be led about in ceremonial processions. When he died the priests embalmed his body, and buried it in the royal sepulchre! So much for the wisdom of the nation which is commonly regarded as the most enlightened of antiquity! The most ancient description of the crocodile is that given by Herodotus in his observations on Egypt in his first book. This account, though mingled with a considerable share of fable, is generally correct; and some of the errors still in existence concerning this animal appear to be derived from his statement: such are the stories of the bird which picks the crocodile's teeth, and that the animal moves only the upper jaw.

The characters of the order are as follows:—The skin is covered with bony plates; the tail is long and compressed laterally. The four feet are short, the limbs feeble, and the five toes are webbed. The vertebræ are concave anteriorly (*procœlous*) or posteriorly (*opisthocœlous*), or at both ends (*amphicœlous*). The sacrum consists of two vertebræ, and the ribs have a head and a tubercle. The jaws bear many similar teeth in distinct sockets. The heart is bilateral. The nasal orifice is single; the tympanum is covered with a fold of skin. The penis is single, and lodged in the cloaca. The group thus defined ranges from the Oolitic strata to the present time. The most ancient forms, as *Teleosaurus*, from the Lias and Oolite, had the vertebræ amphicœlous, but the concavity was so slight in some species that they appear flat. The *Streptospondylus*, from the Lias, Oolitic, and Wealden strata, had opisthocœlous vertebræ, while the Tertiary and existing genera are procœlous. But it must be remembered that though this is the general rule, exceptions occur in all these divisions. The group shows affinities to the birds, inasmuch as the quadrate bone to which the lower jaw is articulated is attached to the side of the skull; the heart in the crocodile is four-chambered, and a median carotid passes to the head along the under surface of the cervical vertebræ. The arrangement of the muscles of the tail, on the other hand, recals that in the fishes. The stomach is globular, and like that of the birds has two tendinous discs. There is no cœcum, gall-bladder, nor urinary bladder, the ureter, with the rectum and genital organs, opening into a common cloaca. The families now recognized are *Alligatoridæ*, *Crocodilidæ*, *Gavialidæ*, and the two groups already mentioned of extinct genera. The alligators have the teeth unequal, and the first and fourth in the lower jaw are received into pits of the upper. All are New World forms, but remains of animals belonging to this family are found in the Eocene strata of England. The alligator of the Mississippi (*A. lucius*, Cuv.) has the nostril divided by a septum, and bony plates only on the back, and they are not united with each other. The genus *Caiman* has the nostril simple, the dorsal plates articulate with each other, and abdominal plates are present. The two species (*C. palpebrosus* and *C. trigonatus*) are to be found in tropical America. The genus *Jacare* is South American; the snout is broad and flat, but the plates are as in the cayman. The gavials have the head very long; the first and fourth teeth are received into grooves of the upper jaw; the cervical and dorsal plates form a continuous series, and there are no abdominal plates. The gavial proper (*Gavialis gangeticus*) has twenty-seven or twenty-eight teeth in the upper, twenty-five or twenty-six in the lower jaw, and these are directed outwards and forwards; the genus is confined to the East Indies. The genus *Rhynchosuchus* is found in Borneo and Australia. The *Crocodilidæ*, to which the crocodile in the strictest sense belongs, have unequal teeth, which in the crocodile of the Nile are $\frac{18-19}{15}$; the first tooth is received into a pit, the fourth into a groove of the upper jaw. There are no abdominal plates; the cervical and dorsal plates are distinct for the most part. The crocodile of the Nile (*C. vulgaris*) is the best known member of the order: the other species (*C. palustris*) is met with in South Asia, Sunda, and the Moluccas. Other species have been erected into genera and sub-genera on account of more or less important differences in the shape of the head, &c., but the family as a whole is a very natural one.

These reptiles are truly formidable, from their great size and strength, and if they were not rendered unwieldy by the length of the body and tail might become as dreadful on land as in the water, where they can act to the greatest advantage. Where they abound it is extremely dangerous to venture into the rivers for the purpose of bathing, or to be carelessly exposed in a small boat. On shore their shortness of limb, great length of body, and difficulty of turning or of advancing otherwise than directly forward, enable men and animals readily to escape pursuit. For a crocodile of 12, 15, or 18 feet in length to turn fairly it must necessarily describe a very large circle. In the water the vast force it can exert by means of the long oar-like tail amply compensates for want of flexibility, and renders the animal more than a match for any of its enemies. The force with which it darts through the water in pursuit of prey resembles the flight of an arrow rather than the progression of a huge animal, and when engaged in rude gambols or in combating with others of its kind the waves are lashed into foam, and may be truly said to 'boil like a pot.' The mouth when expanded forms a horrible chasm, extending even to the ears, and armed around its border by strong pointed teeth. This construction, with the absence of lips and the confined position of the tongue, shows that the action of the mouth is confined simply to seizing and tearing the food. These animals are exclusively carnivorous, feeding on such animals as frequent the waters, and on fish or carcasses thrown into the streams they inhabit. They always prefer their food in a certain state of putrefaction, and are found to keep animals killed by themselves in the mud until this process has begun. In regard to the general character and habits of crocodiles the reader may refer to the account given in the first volume of this work under the title ALLIGATOR, which animal has been more carefully observed. They are so similar in every respect that what is said of the American species will hold good, with very slight modification, of the African.

The crocodile of Egypt is no longer found except in the upper parts of that country, where the heat is greatest and the population least numerous. Anciently the species was common nearly to the outlet of the Nile; and it is stated by Pliny that they used to pass the winter months buried in the mud in a state of torpidity. They are still common enough in the river Senegal, the Congo, Niger, &c. The size to which these creatures grow is very remarkable, and would lead us to believe that they live to a vast age. It is stated by excellent authorities that individuals have been killed in Upper Egypt measuring 30 feet in length. M. Cloquet, who was one of the French Institute engaged in exploring that country while the armies of the republic were present, saw a crocodile 25 feet long.

CROCOISITE. In this mineral, which is lead chromate, or red-lead ore, $PbCrO_4$, Vauquelin, in 1797, discovered chromium. It was originally brought from Nischne Tagilsk, in Siberia, where it occurs in veins

passing through decomposing gneiss. It has since been met with in other localities. It is found massive, but also in crystals, which belong to the oblique system. It has a red colour, but when powdered is orange-yellow, and is then used as a paint, though of course the artificial compound is for this purpose almost in exclusive use. It is soft, translucent, and has a high lustre. Specific gravity about 6. It dissolves in hot nitric acid; when heated it darkens, and at a higher temperature fuses to a very dark fluid, which solidifies on cooling to a dark slaggy or vitreous mass.

CROCUS, a genus of plants of the order Iridaceæ, often possessing much beauty, and forming one of the most common ornaments of the garden. The most of the species are natives of the south of Europe and the Levant; and though the most of them have been introduced into Great Britain, not more than three are found in it growing wild. They may be divided, according to their period of flowering, into *vernal* and *autumnal*. Among the vernal may be mentioned *C. vernus*, whose white or purple flowers make it a welcome guest in spring; *C. versicolor*, distinguished by the yellow tube of its flower bearded with hairs, and its sweet scent; *C. biflorus*, with beautiful pencilled sepals, and clear or bluish white petals; and *C. susianus*, or the cloth-of-gold crocus, characterized by its coarsely-netted root-skin and its small, deep yellow flowers, with sepals which are feathered with dark chocolate brown and rolled back when expanded to the sun. Among the autumnal species is *C. sativus*, probably of eastern origin, but cultivated from time immemorial, in all climates suited to it, for its long, reddish orange drooping stigmas, which when dried form the saffron of commerce and pharmacy. See SAFFRON.

CRŒSUS, the last King of Lydia, and the son of Alyattes, lived in the sixth century before Christ. He was brave, and augmented his empire by the conquest of many provinces of Asia Minor, so that the territory governed by him stretched from the northern and western coasts of Asia Minor to the Halys on the east and Mount Taurus on the south, and included the Greek colonies of the mainland. His riches, which he obtained chiefly from mines and the gold-dust of the river Pactolus, were greater than those of any king before him, so that his wealth became proverbial. Proud of his treasures, he carried his love of splendour to extravagance, and thought himself the happiest of men. Herodotus tells us that Solon visited him at his court, and on being asked by him who was the happiest man he knew mentioned first Tellus, then Cleobis and Biton, all three humble individuals of Greece who had died in the midst of a virtuous career. The story of these individuals, as related by Solon, is one of the most affecting and charming passages in the work of the father of history. Crœsus manifested displeasure that the choice of the sage had not fallen upon him; but Solon reminded him that no one can be safely pronounced happy until his death; and Crœsus was soon forced to acknowledge the truth of the reflection, having lost two beloved sons by violent death, and having been conquered himself by Cyrus, against whom he had waged war in order to put a check upon the growing power of Persia. He was taken prisoner in his capital, Sardis (B.C. 546), and having been placed on a pile in order to be burned he three times exclaimed, 'Oh Solon!' Cyrus having learned the meaning of his exclamation was much moved, ordered him to descend, took him as his companion in his wars, and treated him well. The time of the death of Crœsus is not known. He was alive in the reign of Cambyses, the son and successor of Cyrus. He is represented as one of the most pious among the ancients, constantly labouring to please the gods. Some historians deny the interview with Solon; others do not mention his having been sentenced to be burned: at all events, the history as it is told in Herodotus is equalled by few narratives, true or fictitious, in touching simplicity.

CROIX, ST., is the name of many rivers and places, as is also *Santa Croce* in Italian, *Santa Cruz* in Spanish, and the compositions with *Kreuz* in German.

CROKER, THE RIGHT HONOURABLE JOHN WILSON, a distinguished politician, noted chiefly for his connection with the Quarterly Review, was born at Galway, Ireland, on 20th December, 1780, and was descended from a cadet of an ancient Devonshire family, who had emigrated from England in the beginning of the seventeenth century. He was educated in Cork, and afterwards at Trinity College, Dublin; and having adopted the legal profession, was called to the Irish bar in 1802. His attention, however, was mainly devoted from the first to literature and politics. In 1803 he published anonymously Familiar Epistles to J. F. Jones, Esq., on the Present State of the Irish Stage, and in 1805 an Intercepted Letter from China, both clever and biting satires. In 1807 he published a serious pamphlet, entitled The State of Ireland, Past and Present, in which he advocated strongly Catholic emancipation; and in 1808 entered Parliament as member for the borough of Downpatrick. Shortly after entering Parliament he gave signal proof of his talent for debate by his speech in defence of the Duke of York, on the celebrated discussion occasioned by the malpractices of Mrs. Clarke. The same year (1809) the post of secretary to the admiralty was conferred on and retained by him under successive administrations till the reign of William IV., during which period he represented various boroughs in Parliament. In 1828 he became a member of the privy-council. The reform bill was strenuously opposed by him, and on the passing of that measure he withdrew from public life. One of the founders of the Quarterly Review, he was from the first, and throughout his life, one of its ablest contributors, though the brilliancy of his articles is too often tarnished by the causticity and malevolence of his attacks. Croker's other writings comprise an edition of Boswell's Life of Johnson, which received a severe castigation from Lord (then Mr.) Macaulay, his great political rival, in the Edinburgh Review; Ulm and Trafalgar, and Talavera, two poems of considerable merit; Stories from the History of England, from which Sir Walter Scott derived his idea of Tales of a Grandfather; Military Events of the French Revolution of 1830; Letters on the Naval War with America; and Songs of Trafalgar. He also edited the Suffolk Papers, Lady Hervey's Letters, Lord Hervey's Memoirs of the Reign of George II., and Walpole's Letters to Lord Hertford. He died on 10th August, 1857.

CROKER, THOMAS CROFTON, an Irish writer of considerable merit, was born at Cork on 15th Jan. 1798, and was the only son of Major Thomas Croker, of the 38th Regiment. At the age of fifteen he was placed in a merchant's office in Cork, and when a young man, was in the habit of making extensive excursions on foot through the south of Ireland, where he collected many of the songs and legends current among the peasantry. In 1818 his father died, and the following year an appointment in the admiralty was obtained by him, through the interest of the secretary, John Wilson Croker, a friend of his family, though no relation. In this office he ultimately rose to the position of a clerk of the first class, with a salary of £800, and retired in 1850 with a pension of £580. His first literary work was his Researches in the South of Ireland, published in 1824; followed

next year by his admirable Fairy Legends and Traditions of the South of Ireland. Legends of the Lakes, or Sayings and Doings at Killarney, appeared in 1829; and the Adventures of Barney Mahoney, and My Village *versus* Our Village, in 1832. In 1839 he published an edition, with notes, of the popular songs of Ireland. Numerous articles were also contributed by him at different times to various annuals, Frazer's Magazine, the Literary Gazette, and the New Monthly Magazine. Mr. Croker died at Old Brompton, London, on 8th August, 1854.

CROLLIUS, Oswald, was born of respectable parents about 1580, at Wetter, in Oberhessen. He studied at Marburg, Heidelberg, Strasburg, and Geneva, devoting himself to medicine, and especially to chemistry. He next became tutor to a young nobleman, and then physician to Prince Christian of Anhalt-Bernburg, and died in 1609. He is now remembered as the author of a work entitled, Basilica Chymica, which appeared at Frankfort in 1609, and went through eighteen editions, was translated into French, into German, and by Richard Russell into English, under the title of Royal and Practical Chymistry (London, 1670). This work is a remarkable mixture of speculative ideas about the action of chemical substances in different diseases, and practical skill in the preparation of the substances themselves. Crollius was obviously quite familiar with the details of the processes he describes, although they sometimes would, sometimes would not yield the bodies he intended, and although he was of course ignorant of the true composition of many of them. By his manipulative skill he discovered new preparations, which he introduced into medicine, and which still remain, and this practical ability seems to have given weight to his therapeutic theories. In this latter part he entirely followed Paracelsus, for whom he entertained the greatest respect, and of whose system he gives an excellent exposition.

CROLY, Rev. George, LL.D., an eminent author and divine, was the son of a Dublin physician, and born there in August, 1780. He studied for the church at Trinity College, Dublin, and after taking orders was appointed to a small curacy in Ireland, but soon resigned it and proceeded to London, where he obtained employment as dramatic critic to the New Times. He subsequently contributed to the Britannia, Standard, and Herald newspapers; to Blackwood's, and other magazines; and was for some time editor of the Universal Review. His separate literary works comprise—Paris in 1815, a descriptive poem; the Angel of the World, an Arabian tale; Catiline, a tragedy; the comedy of Pride shall have a Fall, acted with great success at Covent Garden in 1824; Salathiel, a most powerful romance, founded on the legend of the Wandering Jew, and the most finished of his imaginative works; Tales of the Great St. Bernard; Marston; and the Modern Orlando, a fragmentary poem. He is also the author of a Personal History of King George IV.; the Political Life of Burke; an edition of the works of Pope and of Jeremy Taylor; a Treatise on the Apocalypse; Divine Providence, or the Three Cycles of Revelation; and numerous sermons. In 1835 he was presented by Lord Brougham to the rectory of St. Stephen's Wallbrook; and in 1847 received the additional appointment of afternoon preacher at the Foundling Hospital. As a preacher he was deservedly popular. By his wife, who predeceased him in 1851, he had five sons and a daughter. His eldest son was killed in the campaign on the Sutlej in 1845. On 24th November, 1860 Dr. Croly, while walking in Holborn, was suddenly struck down by disease of the heart, and shortly afterwards expired.

CROMARTY, a small county in the north of Scotland, consisting of fourteen detached portions scattered over the county of Ross, and distant several of them nearly 10 miles from each other. The total area is about 220,800 acres. This singularly awkward county was formed at the request of an Earl of Cromarty, who desired that one county might contain all his lands wherever situated. See Ross and Cromarty.

CROMARTY, a seaport town and parliamentary burgh of Scotland, situated on a low point of land forming the north-eastern extremity of the peninsula which separates the Moray from the Cromarty Firth, 16 miles N.E. of Inverness. It is irregularly built, and many of the houses have an antique appearance, but the general aspect of the town is that of a neat and cheerful place. There are several churches, and a town-house with a clock-tower. Sail-cloth, ropes, and beer are made, and the herring and white fisheries are carried on, as well as the curing of pork. The pier may be approached by vessels of 400 tons. Cromarty is a member of the Wick district of burghs. It was the birth-place of Hugh Miller. Pop. 1481.

CROMARTY FIRTH, a long, narrow inlet of the sea running into the united county of Ross and Cromarty in a south-easterly direction, and having a length of about 18 miles, and an average breadth of 2 to 5 miles. Its entrance from the Moray Firth, between two bluff wooded headlands called the Sutors of Cromarty, is about a mile wide, with 30 to 40 fathoms water. Being completely land-locked it affords excellent shelter for shipping, and is often crowded in stormy weather. At its upper end it receives the river Conan, and this portion of the firth is shallow, several square miles of mud-flats being laid bare at low-water. On its shores are the towns of Cromarty, Invergordon, and Dingwall.

CROMER, a small seaport town of England, county Norfolk, 21 miles N. of Norwich, on a plain commanding a fine view of the Bay of Cromer, and sheltered on three sides by well-wooded hills. It is much frequented by sea-bathers on account of its fine beach and beautiful scenery. The inhabitants are chiefly fishermen. A small coasting trade is carried on, but there is no harbour. The bay is so dangerous as to have obtained from sailors the name of the Devil's Throat. Pop. of parish, 1423.

CROMLECH, the name given to a kind of ancient sepulchral monuments, numbers of which have been found in all parts of the British Islands, as well as on the continent of Europe, in Asia, and in America. A cromlech consists of three or more columns of unhewn stone supporting a large tabular block so as to form with it a rectangular chamber, beneath the floor of which is generally found a sepulchral chamber or cist inclosing a skeleton, with arms, stone implements, and other ancient relics. Sometimes the cromlech was encircled by a ring of standing stones, as is seen in the case of the Standing-stones of Stennis, in Orkney; and sometimes it was itself buried beneath a large mound of earth. Among the most remarkable cromlechs in England are those known as Kit's Coty House, near Aylesford, in Kent, consisting of three upright stones with a very large flat one above them; the cromlech of Chun Quoit, in Cornwall, the capstone of which is calculated to weigh 20 tons; and two cromlechs standing beside each other at Plas Newydd in Anglesey. Among cromlechs in Scotland we may mention one near Craigmaddie House, Stirlingshire, known as the Auld Wives' Lifts, remarkable for being a complete cromlech consisting of three stones only; and a partially ruined one at Bonnington Mains, near Edinburgh, called the Witch's Stone, the capstone of which measures 11½ feet in length, and 10½ feet in greatest breadth. The term cromlech is supposed

by Professor Daniel Wilson to be derived from *cromadh* (Gaelic) or *cromen* (Welsh), signifying a roof or vault, and *clach* or *lech*, a stone, and would therefore mean the *suspended* or *vaulted stone*.

CROMPTON, SAMUEL, the inventor of the mule-jenny, was born at Firwood, near Bolton, on 3d December, 1753. His father, who died when he was five years old, was a small farmer and manufacturer, two occupations which in these days and that locality were not unfrequently combined. Young Crompton was brought up by his mother and an old uncle, and instructed in the manufacturing business. He early displayed a turn for mechanics, and when only twenty-one years of age invented the machine for spinning cotton which is now constantly associated with his name, and was called a *mule*, from its combining the principles of Hargreave's spinning-jenny and Arkwright's roller-frame, both of which had been invented a few years previously. The mule shared in the odium excited among the Lancashire hand weavers against these machines, and for a time Crompton was obliged to take his invention to pieces and conceal it from view. He afterwards refitted it and brought it again into work; but was unfortunately unable to prevent others from appropriating the fruits of his labours, and thus, as in many similar cases, the real inventor derived little or no benefit. Among those who more especially profited by Crompton's machine may be mentioned Sir Robert Peel, father of the statesman. Various improvements were introduced from time to time on the mule, but the original principle, as devised by Crompton, remained the same. In 1812 the sum of £5000 was voted to him by Parliament. This was almost all the remuneration which he ever received for an invention which contributed so essentially to the development of the greatness of Britain as a manufacturing nation. Crompton was a man of the most noble character, but modest and diffident to excess. He died on 26th June, 1827.

CROMWELL, OLIVER, lord-protector of the commonwealth of England, Scotland, and Ireland—one of the most remarkable characters in history—was born at Huntingdon, April 25, 1599. His father was Robert Cromwell, a gentleman who represented the borough of Huntingdon in the Parliament of 1593. Robert Cromwell was a younger son of Sir Henry Cromwell, who was knighted by Queen Elizabeth; and Sir Henry again was a son of Sir Richard Williams, a nephew of Thomas Cromwell, Earl of Essex, whose name he took. Oliver's mother was a daughter of William Steward, of Ely, and could trace her descent back to Alexander, lord-steward of Scotland, the founder of the house of Stuart. Robert Cromwell is often said to have been a brewer by trade, but for this story there is no foundation. Many stories are told of his early years, but the most of them are probably worthy of little credit. We may mention the following:—During his infancy a large ape snatched him out of his cradle, and to the terror of the family mounted with him to the roof of the house. Some years after he was rescued by a clergyman from drowning. The unusually strict discipline of the grammar-school at which he was educated created a disgust in the ambitious boy for all prescribed tasks. While at school he performed with great enthusiasm, in the old play of Lingua, the part of Tactus, who finds a crown and purple mantle. He retained an impression in after life of having seen in his youth an apparition of a gigantic woman at his bedside, who told him that he would become the greatest man in the kingdom. The first really authentic fact in his biography is his leaving school at Huntingdon and entering Sidney-Sussex College, Cambridge, April 23, 1616. Here he remained no more than a year, after which, on the death of his father in 1617, his mother is said to have sent him to study law in London, where some say he became a member of Lincoln's Inn, but of this there is no proof. We are also told that at this time, and for some years, he continued to live a dissolute life, but such statements rest only on the authority of royalist writers. In 1620, at the age of twenty-one, he married Elizabeth, daughter of Sir James Bourchier, a woman whose conduct was ever irreproachable. About this time his mind became imbued with that deep feeling for religion which ever after so strongly characterized him. His change of character was no doubt owing, in a great measure, to his close connection with a religious sect which afterwards became formidable, in a political view, under the name of Puritans and Independents. In 1628 he was member of Parliament, under the reign of Charles I., for the borough of Huntingdon, and distinguished himself by his zeal against Popery. On the dissolution, in 1629, he returned to Huntingdon; in 1631 he went with his family to a grazing-farm he had taken at St. Ives; and four years after, to Ely, where he had inherited a property worth nearly £500 a year. While in this place he successfully opposed some unjust schemes for the draining of the fens, and thereby made himself so popular with the people of the place that they gave him the title of 'lord of the fens.'

The storm was already at hand which was to shake the repose of England. The king wished to reign without a Parliament, and the arbitrary manner in which he imposed taxes, assisted by the prevailing religious feeling and sectarian animosity, inflamed the passions of men, and urged them into political conflict. The opponents of the arbitrary measures of the government were several of them making arrangements to embark with their families for New England. Among those already engaged in this scheme were Cromwell, Hampden, Pym, Hazelrig, and other men afterwards so formidable in the Revolution; but the government forbade their emigration, as the king was fearful that they would help to widen the breach that already existed between the colonies and the English Church. Thus did Charles himself counteract the movements of fortune in his favour. Cromwell returned to Ely, where he lived for a time a quiet and pious life. It was at this period that he wrote to his friend St. John that 'he was ready to do and to suffer for the cause of his God.' He also held meetings of the sectaries at his house, and not unfrequently preached and prayed himself before them.

At length the king was compelled, by the state of affairs in Scotland, to summon a Parliament. Cromwell (who was returned member by the town of Cambridge) and others were so loud in their complaints of abuses in church and state that Charles prorogued the Parliament, but six months after, Nov. 1640, was obliged to reassemble it. In this Parliament, called the *Long Parliament* (from Nov. 1640 to April, 1653), Cromwell attracted notice chiefly by his rustic and slovenly dress, and by the vehemence of his oratory, often degenerating into coarseness. 'That sloven,' said Hampden of him, in answer to a question of Lord Digby who the sloven was, 'hath no ornament in his speech, but he will be the greatest man in England if we should ever come to a breach with the king.' The declaration of grievances called the *remonstrance*, addressed by the Parliament to the king, which was passed by a small majority, and which brought on the civil war, was strongly supported by Cromwell.

On the breaking out of the war in 1642, being appointed captain, and afterwards colonel, he raised a troop of horse (the 'Ironsides') composed of zealous

Puritans, who were ready to risk all for the cause of God. The address with which he infused his own spirit into his soldiers, and the strict discipline which he maintained, gave token of the sagacity with which he afterwards ruled three kingdoms. His first military exploit was to capture the magazine at Cambridge, along with the university plate, which was to be sent to the king to defray the expenses of the war. He then routed the royalists, and made himself master of their supplies. This success very much facilitated the Parliament's levies, while it had the opposite effect on those of the royalists. His troops behaved with remarkable order, except on occasions when their religious feelings were excited. He laid the foundation of his military fame by the relief of Gainsborough, which he accomplished by defeating a force triple his own in numbers. Not long after this he held command together with the Earl of Manchester in six of the eastern counties, and received an addition to his forces of 2000 men. In October, 1643, he was assailed by a greatly superior royalist force at Winceby, but defeated it. In this action he had a horse killed under him, and was himself struck down while in the act of rising. In February, 1644, he was appointed one of the committee for conducting the war, and managing the affairs of the country generally. On July 3 of the same year the battle of Marston Moor was gained by the parliamentary army, a result which was mainly brought about by Cromwell and his Ironsides. Cromwell also bore a distinguished part in the second battle of Newbury (Oct. 27, 1644) under the Earl of Manchester, who, both here and elsewhere, showed but a half-hearted zeal against the royal cause, and, indeed, the Presbyterian party in general to which Manchester belonged were averse to pushing matters to extremity with the king. The Independent party, on the contrary, led by Cromwell and his friends, were for pursuing the war with the utmost vigour, and in order that they might have their own way they determined to get the entire control of the army into their hands. In order to accomplish this, they procured the passing of the *Self-denying Ordinance*, which prohibited members of either house of Parliament from holding any military command, on the ground that vices and corruptions had crept into the army, that it required to be remodelled, and a stricter discipline maintained. This measure, of course, rendered it necessary for Cromwell to give in his resignation with the rest, but his friends were pretty sure that an exception in his favour would be made. Sir Thomas Fairfax was made lord general in place of Essex, while Cromwell, notwithstanding the Self-denying Ordinance, was again placed under him, with the command of the cavalry, and the rank of lieutenant-general. Cromwell now introduced into the whole army the excellent discipline in which he had already trained a part of it, and gained the decisive battle of Naseby (June 14, 1645), in which the king was routed with great loss, all his artillery, many thousand stand of arms, and all the baggage, falling into the hands of the enemy. Cromwell got possession of the correspondence of Charles I. with the queen, from which the Parliament published all the passages which would injure the king and queen in public opinion. The spirit in the army, which the officers, and especially Cromwell, excited by their sermons and prayers, had now risen to fanaticism; though at the same time good order and morality were so well maintained, that profanity, drunkenness, robbery, and the like offences, hardly ever occurred. Perhaps no finer nor better behaved body of troops ever took the field. After Naseby no time was lost by the parliamentary leaders in following up their success. Leicester was retaken, Taunton relieved, Bridgewater stormed, Bristol, which was held by Prince Rupert, was besieged and surrendered, Devizes was stormed, Winchester surrendered, Dartmouth was stormed, and finally Sir Jacob Astley, at the head of 3000 horse, was defeated at Stow-on-the-Wold, March 21, 1646.

The royal party was now completely crushed, and Charles I. took refuge with the Scottish army (May 5, 1646), but was soon given up by them to the Parliament, on which occasion Cromwell was one of the commissioners. The Parliament was now in possession of the supreme power. It distributed rewards to its adherents, and Cromwell received £2500 a year from the estates of the Marquis of Worcester. But when the Parliament, in which the Presbyterian element predominated, wished to disband the army, which was headed by the Independents, the soldiers appointed a council of officers and a body of subalterns and privates called *Adjutators* (misspelt *agitators*), who declared to the Parliament that they would not lay down their arms till the freedom of the nation was established. Some of the soldiers conducted themselves so boldly that the Parliament ordered their arrest; on which occasion Cromwell not only supported the house, but with tears in his eyes deplored the seditious temper of the troops, which, he said, had even put his own life in danger. Some of the members, however, saw in him the secret mover of those measures, and accordingly proposed his apprehension; but on that very day Cromwell repaired to the army, in order, as he wrote to the lower house, to restore the deluded soldiers to their duty, and at the same time requested that Fairfax and the other officers would co-operate with him to this end. On the same day (June 3, 1647) one of the adjutators, Joyce, forcibly carried off the king from Holmby, and delivered him into the hands of the army. Cromwell seems at this time to have contemplated the restoration of the king. But he was convinced, on a nearer view of the spirit that reigned in the army, that he could not venture such a measure without danger of his life; besides, he was only second in command, and could not reckon on the assistance of some of the most influential men, who were most zealous republicans, and had already begun to discuss the question of judicially punishing the king. Cromwell was at first well disposed towards the king, and, supported by Fairfax and others, he even entered into a treaty with him, which would have conferred certain advantages on himself, but he soon discovered that Charles was not to be trusted, and that the king's success would be his destruction. He accordingly declared publicly that he could no longer trust the king's word, and the House of Commons resolved not to enter into any more treaties with the king. Fighting now took place with the royalist party in Wales, but Cromwell soon finished the struggle in this quarter; after which he proceeded against the Scotch, who had raised a strong army 'to deliver the king from sectaries.' The king was at this time kept in Carisbrook Castle in the Isle of Wight. As Fairfax, from Presbyterian scruples, declined the command of the expedition against Scotland, Cromwell undertook it with more eagerness as he knew the weak condition of the Scottish army, and had for many years heartily disliked the Scottish people. With a much inferior force he defeated them at Preston (August 17, 1648), and was received in Edinburgh as a deliverer. Now followed the tragedy of the king's execution (see CHARLES I.), who was beheaded January 29, 1649. Cromwell's name stood third in order in the death-warrant, and though he may have been impelled to the step by the force of circumstances and by his knowledge of the king's faithlessness, there is no reason to suppose that he ever regretted the share he took in the death

of the king, or thought that he was unjustly punished. Affairs in Ireland now demanded his presence, and having been appointed lord-lieutenant and commander-in-chief, he joined the troops there in Aug. 1649. Victory was now to raise him still higher in the favour of the people. He took Drogheda by storm (September, 1649), where he gave orders that nothing should be spared. 'This bitterness,' he said, 'will save much effusion of blood, through the goodness of God.' Most of the cities opened their gates without resistance, and Cromwell, trusting to the terror of his name, though his army was greatly weakened by sickness, marched boldly into the interior, where cowardice and treachery everywhere yielded him a submissive welcome. Within six months the royalist party in Ireland was wholly crushed.

Resigning the command to Ireton, he now undertook, at the request of the Parliament, a similar expedition against Scotland, where Charles Stuart, afterwards Charles II., had been proclaimed king. Cromwell had at first desired that Fairfax should take the command of the army; but Fairfax had taken the Covenants (see COVENANT), and would not fight against the Scots. Cromwell was therefore appointed commander-in-chief, and marched into Scotland, where the troops of the enemy were commanded by Leslie. Being ignorant of the nature of the country, his supplies were cut off, his army became sickly, his retreat was intercepted, and he must have been forced to surrender at Dunbar had the Scots avoided a battle. When he saw them advance he exclaimed, 'The Lord hath delivered them into our hands!' The victory at Dunbar (September 3, 1650) rid the fortunate general of his enemies the Presbyterians. He then marched into Edinburgh. Meanwhile King Charles had collected new forces; but Cromwell, by skilful marches near Stirling, cut him off from his points of support, when, contrary to his expectation, the king entered England, and threatened the metropolis itself. Cromwell hastened after the Scottish troops into England. Everything was done to strengthen the army of Cromwell, who conducted himself like an active and resolute general, while in the royal camp irresolution and discord prevailed. Charles was totally defeated at Worcester, September 3, 1651. This victory, which Cromwell called the *crowning mercy* of God, gave the commonwealth party full power over three kingdoms. Cromwell was rewarded with an estate of £4000 a year, besides receiving other honours.

Cromwell already exerted a weighty influence on the supreme direction of public affairs. He succeeded in restoring the continental relations of England, which had been almost entirely dissolved, and regulated them so as to promote the interests of commerce. The navigation act, from which may be dated the rise of the naval power of England, was framed upon his suggestion, and passed in 1651. At the same time the general, who was honoured by the city of London as the father of his country, was aiming at sole sovereignty. The only man whom he feared, Ireton, was dead. At a consultation with some members of Parliament and the most distinguished officers on the form of government to be established, he recommended a species of monarchy, but was silent when some lawyers in the convention proposed the young Duke of Gloucester for king. Meantime the Long Parliament, which was aiming to establish its own power, was growing more and more unpopular, in consequence of its undisguised tyranny, the war which it had provoked with the Dutch, and its treatment of the prisoners taken at Worcester, some of whom were put to death in prison, and others sold for slaves in the colonies. A frightful tempest, too, which occurred on the day of the execution of a London clergyman of the name of Love, made a deep impression on the people. And now Cromwell broke silence. He spoke openly to his friends of the ambition, the godlessness, and injustice of the Parliament. Encouraged by their support, he at last hazarded a decisive step, and with 300 soldiers dispersed that body, 'for the glory of God and the good of the nation' (April 20, 1653). He then summoned a council of state, consisting mainly of his principal officers, which finally chose a Parliament of persons selected from the three kingdoms, which, from Praise-God Barebone or Barbone, one of the principal characters in it, by trade a leatherseller, was nicknamed *Praise-God Barebone's Parliament*, another name being the *Little Parliament*. Cromwell himself opened the session with a speech, in which he said that the day was come on which the saints were to commence their reign upon earth.

Fifteen months after a new annual Parliament was chosen; but after a session of five months Cromwell prevailed on this body, who were totally incapable of governing, to place the charge of the commonwealth in his hands. The chief power now devolving again upon the council of officers (December 12, 1653), they declared Oliver Cromwell sole governor of the commonwealth, under the name of *lord-protector*, with an assistant council of twenty-one men. The new protector behaved with dignity and firmness. With the aid of General Lambert he formed a constitution called the *Instrument of Government*, by which the protector with his council was invested with the power of peace and war, and was to summon a Parliament once every three years, which he should not dissolve under five months: the supreme legislative authority was declared to be and to reside in the lord-protector and Parliament; all commissions, patents, writs, processes, &c., were to run in the name of the lord-protector; all the forces of the kingdom were to be under the protector and Parliament during the sitting of the latter, but in the intervals of Parliament, under him and the council alone. In case of his death, the council were immediately to choose a new protector; but no protector after him was to command the army. Cromwell, having concluded peace with Portugal, turned the resources of the state to the enlargement of its navy and commerce. France and Spain courted the friendship of the fortunate protector, who at length united with Cardinal Mazarin, in order to increase the colonial power of England. To make a thorough reduction of Scotland, he gave orders to General Monk to plunder every place that made resistance, and put the garrison to the sword—orders which were so rigorously executed by Monk, that terror insured the most implicit submission. The nobles feared, the clergy hated the protector; while the people, whom he treated with equity and kindness, loved him, because they enjoyed much more liberty under him than before. The protector treated Ireland with great severity. Here, however, as in Scotland, he established an equitable form of government, which, in the course of a few generations, would have very much improved the state of the island. But in England the situation of the protector was far from being secure. A member of Parliament loudly declared that he could not brook, after the overthrow of one tyrant, to see the liberties of the nation shackled by another, whose prerogative had no measure but the length of his sword; and Cromwell met so much opposition, that after the first five months he dissolved the Parliament.

On the whole, his political administration was masterly, and adapted to the circumstances of his situation. He established large magazines of provisions;

the pay of the soldiers was regularly delivered to them a month in advance; yet the public revenues were strictly and economically managed, without any additional imposts. He appointed for judges the most upright and distinguished men. Among these was the famous Sir Matthew Hale. He never interfered with the proceedings of the courts of justice. In religion he acted on the principle of toleration Every man had liberty of conscience. In other things, too, Cromwell, as his own correct judgment prompted, would have governed with mildness and justice, promoted the arts and sciences, and healed the wounds of the nation; but he was obliged to maintain his power, as he had acquired it, against his better will, by a severity often amounting to tyranny. In order to collect the fines imposed on the royalists, to prosecute those whom he suspected, perhaps also to disunite the army, the protector divided England into twelve military jurisdictions, and placed over each a major-general with absolute power, from whose decisions there was no appeal, except to the protector himself; but he speedily broke up this odious system of government.

On the other hand he strengthened the British navy. The famous Admiral Blake, and other naval heroes, fought several well-contested battles with the Dutch fleets under De Ruyter, Tromp, and others. In the peace with Holland (April 16, 1654) England maintained the honour of her flag, and the navigation act gave a new impulse to the colonial trade. The skilful and fortunate conduct of the war with Spain, from 1655 to 1658, in which Jamaica and Dunkirk were taken, made the new Parliament, from which Cromwell had carefully excluded all republicans, so obsequious, that they at last offered him the title of *king*. Some individuals, among whom was Lambert, the second in command of the army, who was in hopes of being protector after Cromwell, and the majority of the officers, opposed the measure so resolutely that Cromwell, fearing the fate of Cæsar, declined the title. His brother-in-law, Desborough, and his son-in-law, Fleetwood, also dissuaded him from accepting it. For this the Parliament, by an act entitled Humble Petition and Advice, gave him the title of *highness*, and the right of appointing his successor; and he was a second time solemnly invested by the speaker with the ensigns of his office—a velvet mantle of purple-colour, symbolical of justice and mercy, the Bible, the staff, and the sword.

Cromwell, the lord of the three kingdoms, the mightiest potentate in Europe, and worthier than any other of his high station, was unhappy in the last years of his life. In his heart he wished to govern on mild and constitutional principles; but self-preservation compelled him to be severe and suspicious. He at last governed without a Parliament, since none was pliant enough for him; and the bigots who once extolled him, now called him a shameful tyrant. Their conspiracies against his life kept him in continual alarm. He never went out without a guard; no one knew what route he would take; he usually turned back after starting, and took another direction; he wore a shirt of mail under his dress, and seldom slept two nights sucessively in the same room. According to Ludlow's account, he expressed on his death-bed some fears that his memory would be insulted, and his remains trampled upon. The first symptoms of his last sickness appeared upon the death of his favourite daughter, Elizabeth Claypole, in the beginning of August, 1658. Towards the end of the month he was confined to his room from a tertian fever, and on September 3, 1658, he died at Whitehall, whither he had been brought from his favourite residence, Hampton Court. He was in the sixtieth year of his age. His last words appeared to be those of a person interceding with God for the people. He was buried in King Henry VII.'s Chapel, in Westminster Abbey. Most of the European courts went into mourning for him, even that of Versailes. After the Restoration his body was taken up and hanged at Tyburn, the head being fixed on a pole at Westminster Abbey, and the rest of the remains buried under the gallows.

Great as a general, Cromwell was still greater as a civil ruler. He lived in a simple and retired way, like a private man, without any parade or ostentation. He was abstemious, temperate, indefatigably industrious, and exact in his official duties. His exterior inspired neither love nor confidence; his figure had neither dignity nor grace; his conversation and manners were rude and vulgar; his voice was harsh; in his public speeches he expressed himself with force and fire, but without method or taste. On the other hand, he possessed extraordinary penetration and knowledge of human nature; no one knew so well as he the art of winning men and using them to his purposes. He devised the boldest plans with a quickness equalled only by the decision and intrepidity with which he executed them. No obstacle deterred him; and he was never at a loss for expedients. Cool and reserved, but full of great projects, he patiently waited for the favourable moment, and failed not to make use of it. In his religious views he was an upright and tolerant Calvinist.

He had appointed his eldest son, Richard, his successor; but the republican and religious fanaticism of the army and officers, with Fleetwood at their head, now subverted, as it had formerly served, the projects of Cromwell. The mild and virtuous Richard was compelled by the mutinous officers to dissolve the Parliament; and a few days after, conscious of his incapacity, he voluntarily abdicated the protectorship, April 22, 1659. His brother Henry, who had talent, bravery, and mildness of temper, and who, from 1654, had governed Ireland in tranquillity, improved its trade, and won the affections of the people by his upright administration, followed the example of Richard, and died in privacy in England. Richard lived in narrow circumstances, his property being nearly exhausted in the expenses of his father's funeral. At the Restoration he went to the Continent, and returned to England in 1680, and assuming the name of *Clark*, passed the remainder of his days in tranquil seclusion at Cheshunt, in Hertfordshire. He died in 1712, at the age of eighty-six. For further information respecting the life of Cromwell the reader may consult Foster's Statesmen of the Commonwealth of England; Carlyle's Oliver Cromwell's Letters and Speeches; Gleig's Lives of the most Eminent British Military Commanders; besides these, the various collections of Cromwell's letters and state papers. See also Guizot's History of the English Commonwealth.

CROMWELL, Oliver, the great-grandson of Henry Cromwell, son of the protector, and the last of his known descendants, practised as a solicitor in London for several years, and was clerk to St. Thomas' Hospital. He succeeded to the estate of Theobalds, which descended to him through the children of Richard Cromwell, eldest son of the protector, and died at Cheshunt Park, Hertfordshire, May 31, 1821, aged seventy-nine. He wrote the Memoirs of the Protector, Oliver Cromwell, and his Sons, Richard and Henry, illustrated by Original Letters and other Family Papers (London, 1820, 4to).

CROMWELL, Thomas, Earl of Essex, was the son of a blacksmith at Putney, in Surrey, and was born about the year 1490. In his youth he was employed as clerk to the English factory at Antwerp.

In 1510 he went to Rome, and on his return to England became the confidential servant of Cardinal Wolsey, about 1525. On his master's disgrace in 1529, Cromwell defended him with great spirit in the House of Commons, of which he was then a member, and effectually opposed the articles of treason brought against Wolsey. After the cardinal's death he was taken into the king's service, into which he entered with zeal, but with little consideration or regard for others. He was knighted and made a privy-councillor, and in 1534 became principal secretary of state and master of the rolls. In 1535 he was appointed visitor-general of all the monasteries in England, in order to suppress them. In this office he acted with great severity and injustice. His services were rewarded by the situation of lord-keeper of the privy seal, and a seat in the House of Peers, with the title of Baron Cromwell of Okeham. On the abolition of the pope's supremacy he was created king's vicar-general, and used all his influence to promote the Reformation. He caused articles of religion to be published by the royal authority acknowledging only three sacraments, and speaking doubtfully of purgatory. He was made chief-justice itinerant of the forests beyond Trent, knight of the Garter, and finally, in 1539, lord high chamberlain, and the following year Earl of Essex. He at length fell into disgrace with the king for the interest he took in promoting his marriage with Anne of Cleves. Her person proved disagreeable to Henry, who fell in love with Catharine Howard, a lady allied to the principal Catholic families; and in consequence of her influence and the royal displeasure Cromwell was arrested at the council table on a charge of treason, committed to the Tower, and a bill of attainder was passed against him. He was beheaded on Tower Hill, July 28, 1540, declaring that he died in the faith of the Catholic Church, from which he confessed he had been seduced. He bore his good fortune with moderation, was charitable to the poor, and willing to benefit the deserving. The Protestants praise him for his industry and solidity, and all the qualities which fitted him for the management of important affairs; while the Catholics dwell on his violence, ambition, and injustice.

CRONSTADT, or KRONSTADT (Hungarian, *Brassó*), a town of Austria in Transylvania, the most interesting town in the land of the Saxons, and the principal seat of the industry and trade of the province, in a mountainous but well wooded and romantic district, 70 miles E.S.E. Hermannstadt. Pop. 27,000. The principal edifices are the Protestant cathedral, the town-house, merchant-house, and Roman Catholic church. A small fortress on a ridge north-east of the town figured much in the insurrection of 1848–49. The principal branches of industry are the manufacture of cloth, leather, and leather goods, candles, shoes, wax-cloth, paper, &c. A very brisk trade is carried on, especially with Roumania.

CRONSTADT, a maritime fortress of Russia, in the government and about 25 miles W. St. Petersburg. It stands in the narrowest part of the Gulf of Finland, opposite to the mouth of the Neva, on a height of the long, narrow, rocky island of Kotlin Ostrow (Finnish, *Retusari*), forming, both by its position and the strength of its fortifications, the bulwark of the capital, the most important naval station, and the most frequented port of the empire. Pop. 45,155. It was founded by Peter the Great in 1710, and was at first very indifferently built, but has now spacious regular streets, with many handsome houses; three Greek churches, with two chapels; a Lutheran, an English, and a Roman Catholic church; very large marine establishments, a navigation school, a naval arsenal, a cannon foundry, a lazaret, barracks, building-yards, docks, &c. The harbour consists of three separate basins—a merchant haven, capable of containing 1000 ships; a central haven for the repair of ships of war; and the war haven, which, in addition to the other works of the place, is defended by the strong fort of Kronslott, built on two small adjoining islands. The chief disadvantages of Cronstadt are its position opposite to the mouth of the Neva, the fresh water of which soon makes the vessels foul, and the long period during which the harbour is blocked up by the ice, which lasts from the end of November to the end of April. The number of ships annually entered and cleared averages about 3000. In 1854–56 the trade of the place suffered a nearly total suspension, the harbour being rigidly blockaded by the British.

CRONSTEDT, AXEL FREDERIC, born at Södermanland, Dec. 23, 1702 (others say 1722), was a baron, councillor of mines, and member of the Academy of Sciences at Stockholm. In 1758, at Stockholm, he published anonymously a work on mineralogy, in Swedish, which did a great deal to throw light on this branch of natural history. He first distinguished between minerals and rocks, and arranged the minerals under the heads of metals, inflammable bodies or resins, salts, earths, and stones, an arrangement which is still followed with slight modifications by some mineralogists. He paid special attention to the chemical composition of minerals, and made that rather than similarity of external characters the reason for placing minerals in the different classes. To assist him in his labours, he made great use of the blowpipe, and devised a compact, portable, but very complete apparatus for the purpose. Indeed he is one of the founders of this branch of analysis. He published a number of papers on different ores and minerals, and was the first to isolate the element nickel. His work on mineralogy was very highly valued; it was translated into English, French, German, Italian, and Russian, and went through several editions. Cronstedt died at Stockholm, August 19, 1765.

The mineral *Cronstedtite*, a ferrous ferric silicate, forming highly lustrous jet-black crystals, and found in Cornwall and other places, has been named in honour of him.

CRONUS, in ancient Greek mythology, a son of Uranus and Ge, the youngest of the Titans. By Rhæa he was the father of Hestia (Vesta), Demeter (Ceres), Hera (Juno), Poseidon (Neptune), and Zeus (Jupiter). Cronus received the government of the world after Uranus was deprived of it, and from him it was taken by Zeus. Cronus was considered by the Romans as identical with their Saturnus. See SATURN.

CROONE, WILLIAM, who died at London, Oct. 12, 1684, is still remembered as the founder of the Croonian lectureship. He was a physician, and for some time professor of rhetoric in Gresham College, and was one of the original members of the Royal Society. He had intimated his intention of founding a lecture, to be delivered yearly, on the laws of muscular motion, but made no arrangements for it in his will. The matter was some years later settled by his sister's will, and the lecture, which was begun in 1738, and is still read annually, is thus carried back to the earliest period of the society's existence.

CROSIER, now the general name for the staff which is borne by some of the higher dignitaries in the Roman Catholic and other churches, and which is probably the oldest of the insignia of episcopal dignity. The word is of the same root with cross, that being now the form of the archbishop's crosier, to which the term more peculiarly applies. The original form of the crosier resembled that of a shep-

herd's crook, and it was not only an ensign of office, but also a symbol of the various duties of a bishop, who used the staff to guide the wavering, the sharp point at the end to stir up the lukewarm, and the crook to draw back the wandering. By degrees this emblem became highly adorned, and was made of costly materials. Artists like Benvenuto Cellini and Giovanni da Bologna were employed to make it. The excess of splendour lavished in later times upon this instrument gave occasion to the following satirical epigram, as translated from the French:—

> 'Our fathers had, in the days of old,
> A crosier of wood and a bishop of gold;
> But now we think it sufficiently good
> If the crosier is gold and the bishop is wood.'

From the middle of the fourteenth century the archbishops began to carry, sometimes in addition to the pastoral crook, sometimes instead of it, a crosier terminating in a cross, often in a double cross, that is, one having two cross pieces near the end, the upper of which was shorter than the lower, and all the ends of which were finished off with trefoil ornaments. The crosier is carried by the bishops and archbishops themselves only in processions and when pronouncing their pastoral benediction, when it is held in the left hand. On all other occasions it is carried before them by a priest. Formerly the abbots and abbesses of certain abbeys had also the right of bearing crosiers, but in their case the crook was always turned inwards to indicate that their jurisdiction was only internal, confined to their own monasteries. At Rome no bishop has the right of bearing the crosier, seeing that the pope himself is the bishop of the city. The crosier of the pope is in the form of a triple cross, that is, a cross with three branches above one another, the lowest of which is the longest, and the highest the shortest. The crosier used in the Greek Church, which is called *dikanikion*, originally consisted of a simple staff ending in a large knob. At a later period it terminated in a ball (representing the world) with a cross above, and two serpents turned round the upper part of the staff with their heads meeting at the top on opposite sides of the staff, like the serpents in the caduceus or wand of Mercury. The staff used in the Armenian Church is, like that of the Roman Catholic Church, in the form of a crook, but the crook always represents a serpent, which symbolizes the pastoral watchfulness and care. See BISHOP and CROSS-BEARER.

CROSS, one straight body laid at any angle upon another; the ensign or emblem of the Christian religion, as being a representation of the instrument of punishment on which Jesus Christ suffered death from the Jews, and hence the form in which many churches and cathedrals are built. The cross of the ancients was simply a piece of wood fastened across a tree or upright post, on which were executed criminals of the very worst class. After the crucifixion of Jesus, and the extension of the Christian religion, the cross was assumed as the ensign of his followers. The cross was used emblematically before the Christian era. Upon a multitude of medals and ancient monuments are to be found crosses placed in the hands of statues of Victory, and of figures of emperors. It was also placed upon a globe, which, ever since the days of Augustus, has been the sign of the empire of the world and the image of Victory. The shields, the cuirasses, the helmets, the imperial cap, were all thus decorated. The cross has also been often stamped upon the reverses of money, as is proved by the old English game of cross and pile. The coins struck at Constantinople, and those of the Franks from the time of Clovis, were also thus marked. Examples of these are given in the dissertation by Ducange, Sur les Médailles Byzantines, and in the treatise by Le Blanc, Sur les Monnaies de France. Sculptured crosses of various descriptions, elevated upon handsome pedestals, were formerly erected in cemeteries and market-places, to designate peculiar events; as the queen's crosses at Northampton, Waltham, &c. Very fine ones are still to be seen in many parts of Great Britain, and particularly in Ireland.

In order to understand the meaning of the sign of the cross among the first Christians, it must be kept in mind that the cross was in their time an instrument of infamous punishment, like the gallows at present, and that they assumed this sign to show that they gloried in being the followers of Christ, notwithstanding the infamy which had been attempted to be thrown upon him by the manner of his execution. The custom of making the sign of the cross in memory of Jesus may be traced to the third century. Constantine the Great had crosses erected in public places, in palaces and churches. This emperor is generally supposed to have been the first who ordered the cross to be used as the sign or emblem under which he would fight and conquer, in remembrance of the miraculous appearance of a cross in the heavens. A certain legend relates that while marching against Maxentius, a cross appeared to him in the sky in a dream, bearing the words *En toutō nika* (In this conquer, *In hoc vince*). In consequence of this he had a standard made bearing this image, and called *labarum*. It was customary in his time to paint a cross at the entrance of a house to denote that it belonged to a Christian. Subsequently, the churches were, for the greater part, built in the form of a cross. But it did not become an object of adoration until the Empress Helena (Constantine's mother) found a cross in Palestine, which was believed to be the one on which Christ suffered, and conveyed a part of it to Constantinople. This is the origin of the festival of the 'Invention of the cross,' which the Catholic Church celebrates on the 3d of May. Standards and weapons were now ornamented with it, and the Emperor Heraclius thought he had recovered the palladium of his empire when he gained possession of a piece of the true cross in 628, which had fallen into the hands of the Persians in 616. In memory of this event, the festival of the 'Exaltation of the cross' was instituted, Heraclius having caused the cross to be erected at Jerusalem, on Mount Calvary. This festival is celebrated on the 14th of September. It is remarkable how this holy relic became multiplied. Numberless churches possessed some parts of it, the miraculous power of which was said to have been proved by the most astonishing facts; and many persons actually believed that it could be infinitely divided without decreasing. It was in vain that the Iconoclasts, who condemned the worship of images, attempted to overthrow the adoration of the cross. The crucifix was considered as a principal object of worship, in preference to the images of the saints, and in compliance with the teachings of John of Damascus, was adored, during the seventh century, in all the churches of the East. That the West also ascribed a mysterious power to this symbol is evident from the use which was made of it in the trials 'by the judgment of God' in the middle ages.

There never has existed any sign which has been so often repeated in works of art as the cross. This may be ascribed in part to its form being applicable to many more purposes than those of other emblems, such, for instance, as the crescent. The distinguishing cipher of the Jesuits is IHS, which signifies *Jesus hominum salvator, In hac (cruce) salus*, or

Jesus in Greek letters, abbreviated. (See ABBREVIATIONS.) Crosses have been the badge of numberless orders, military and civil. To make the sign of the cross is thought by many people in Catholic countries a defence against evil spirits, evil influences, &c. The Greeks make this sign constantly, hardly taking a glass of *raki* without signing the cross over it. Catholic bishops, archbishops, abbots, and abbesses wear a small golden cross. The Catholic benediction is generally performed by making the sign of the cross over the object. There are different kinds of crosses, as the common cross, †, St. Andrew's cross, ×, &c. Two sorts of crosses are used for the forms of churches, the Greek and the Latin. The Greek cross has its arms at right angles, and all of equal length; whereas the Latin cross, in which the limbs are also at right angles, has one of them much longer than the other three. Bramante originally designed St. Peter's for a Latin cross; Michel Angelo reduced it to the proportions of the Greek cross; but Carlo Maderno again elongated it to the original dimensions of Bramante. The cathedral of St. Paul's, London, is a Latin cross, with its base spread by a sort of second transept, which increases the breadth of the western front. See CRUCIFIXION.

Cross, in baptism. In the administration of the ordinance of baptism the practice of making the sign of the cross on the forehead of the person baptized was adopted at an early period, though not enjoined by any express command or sanctioned by any known example in Scripture. The first Christian writer who mentions the cross in connection with baptism is Tertullian, who wrote after the middle of the second century. This writer says that 'at every setting out or entry upon business, whenever we come in or go out from any place, when we dress for a journey, when we go into a bath, when we go to meat, when the candles are brought in, when we lie down or sit down, and whatever business we have, we make on our foreheads the sign of the cross;' and speaking of baptism in his treatise De Carnis Resurrectione he says, 'The flesh is signed that the soul may be fortified.'

CROSS, in heraldry. See HERALDRY—Honourable Ordinaries.

CROSS, EXALTATION OF THE. See CROSS.

CROSS, INVENTION OF THE. See CROSS.

CROSS, VICTORIA. See VICTORIA CROSS.

CROSS-BAR SHOT are shots with iron bars crossing through them, sometimes standing out 6 or 8 inches at both sides. They are used at sea for injuring the enemy's rigging, and in sieges for destroying the palisades in the covert-way, ditches, &c.

CROSS-BEARER (*porte-croix, cruciger*), in the Roman Catholic Church the chaplain of an archbishop or a primate, who bears a cross before him on solemn occasions. The pope has the cross borne before him everywhere; a patriarch anywhere out of Rome; and primates, metropolitans, and those who have a right to the *pallium* throughout their respective jurisdictions. Some archbishops bear a single cross, others a double one, and the pope a triple one. See CROZIER.

CROSSBILL (*Loxia*), a genus of birds which owe both their vulgar and their scientific name (from the Greek *loxos*, signifying oblique) to a remarkable peculiarity of their bill, the mandibles of which are very much curved at the tips, so as to cross each other, sometimes on the one side and sometimes on the other. This genus belongs to the natural order *Insessores*, or perchers, to the sub-order *Conirostres*, and the family *Fringillidæ*, or finches. By some naturalists they are erected into a separate family, *Loxiadæ*. The peculiar form of their bill is an admirable adaptation, enabling them to obtain with great ease their usual food, consisting of the seeds of the pine, which they extract from underneath the scales of the cones. Another circumstance which adapts these birds to their mode of life is the strength of their toes, by which they are able to cling to the cones, and they are often to be seen in this position, remaining for several minutes without inconvenience, sometimes with the head upwards, sometimes with it downwards. They build their nests and breed at all seasons of the year, in December, as in March, April, or May. The common crossbill (*Loxia curvirostra*, Linn.) is found in the northern countries of Europe and Africa. It is now much more common in Britain than it once was. It is from 6 to 6½ inches in length. The old male has a red plumage, and the young male a reddish one, inclining to yellow; the female is of a yellowish-green colour. This species sometimes does considerable injury to apples, tearing them to pieces with its beak in order to come at the seeds. The *Loxia pityopsittacus*, or parrot crossbill, is from 7 to 7½ inches in length. It is readily distinguished from the previous species by its shorter and stronger bill, although in colour it resembles it very closely. It is rarely found in Britain. The *Loxia leucoptera* is smaller than either of the preceding species, and has a weaker bill. It is found in North America, and appears only as a rare visitant in this country. Its chief distinguishing marks are two white stripes running across the wings.

CROSS BILL, in chancery, a bill filed by the defendant in a suit either against the plaintiff or against another defendant. Such a bill is filed in two cases: first, when the defendant desires to obtain a discovery of facts necessary to his defence in the original bill; and secondly, when he wishes to obtain full relief to all parties with regard to the matters on which the original bill has been filed against him. Thus, in a suit brought against the defendant to enforce the specific performance of a written contract which the defendant maintains ought to be given up or cancelled, the defendant may file a cross bill against the plaintiff to prevent him from ever again bringing an action against him on the ground of such contract, and this is the only way in which the defendant in the original suit can be protected against such a course on the part of the plaintiff (Wharton's Law Lexicon).

CROSS-BOW, or ARBALIST, formerly a very common weapon for shooting, but not long used in war after the invention of fire-arms. It is a strong wooden or steel bow fixed to a stock, stretched by the spanner, and shot off by the trigger fixed to the stock. All kinds of weapons in which the bow was fastened to the stock were called cross-bows, some of which were attached to carriages, and drawn by horses. There was a small kind from which were shot little balls. To the larger sort were attached instruments for bending the bow.

CROSS-BREEDING. See BREEDING.

CROSSE, ANDREW, an English physician and man of science, born in the county of Somerset in 1784; died in 1855. After completing his studies at Brazenose College, Oxford, he retired in 1805 to his estate of Fyne Court, where he passed the greater part of his life. Being strongly attracted by the study of electrical phenomena he procured all the necessary instruments, and disdaining to follow the beaten paths, and careless of accepted theories, he entered upon an independent course of observation and experiment. One of his first discoveries was the production of crystals under the influence of electricity. By the action of a voltaic pile upon a vessel of water taken from a neighbouring cave, which was covered in the interior with

crystallizations of arragonite, he obtained in a few days crystals of carbonate of lime. He continued his experiments for thirty days, by the end of which period he had obtained forty-one crystals or non-crystallized minerals, in the form in which they are found in nature, and among these was an entirely new sub-sulphate of copper. Crosse had for several years previous been in the habit of ascertaining the state of the atmosphere by means of electricity. With this view he set up above the trees in the vicinity of his residence an insulated wire of more than a mile in length. In 1816, at a meeting of some friends, he asserted that with the aid of this force it was possible to communicate one's thoughts instantaneously to persons in the most distant parts of the earth, but he never appears to have attempted to demonstrate the truth of his view by actually constructing an apparatus for using electricity as a means of communication. In 1836, while making an experiment in crystallization with a voltaic battery and a strong caustic solution, not in contact with the air of the atmosphere (as he himself at least believed), he observed an acarid (a small animal of the mite kind) in the liquid, and in the space of a few weeks more than 100 others were formed. This discovery, which was confirmed by Professor Faraday, produced a great sensation, and caused Crosse to be denounced by the clergy for his impiety, as one who professed to create living beings from inorganic matter. This, however, Crosse never pretended to do, but only to make them appear in some inexplicable way, under certain conditions. Among the practical results of the experiments of Crosse may be mentioned the discovery of a process of purifying salt water by electricity. He also made some curious discoveries relative to the effects of positive and negative electricity on vegetation. A collection of his literary remains, including a number of poems, was published by his widow after his death.

CROSS-EXAMINATION, the examination of a witness called by one party by the opposite party or his counsel.

CROSS-FIRE, in the art of war, is when the lines of fire from two or more parts of a work cross one another. It is frequently made use of to prevent an enemy's passing through a defile. The flanks as well as the faces of two adjoining bastions afford the means of cross-fire, as do also the faces of two adjoining redoubts.

CROSS-STONE. Two minerals are distinguished by this name. Jameson gave it to the mineral *harmotome*, because its crystals cross each other at right angles. This mineral is a hydrated silicate of barium and aluminium, with traces of alkalies, and is met with at Strontian, in Argyleshire, and near Glasgow, in the Kilpatrick and Campsie Hills. It has also been applied to *chiastolite*, because the summits of the crystals are often marked by dark lines forming a cross, or the Greek letter χ. The mineral staurolite (Greek *stauros*, a cross), a silicate of iron and aluminium, might also be called cross-stone, because in it the separate crystals cross one another. Harmotome, however, has by some mineralogists been called *staurolite*, so that some confusion is apt to attend these names unless the chemical composition or other characteristic feature is indicated at the same time.

CROTALIDÆ, a family of reptiles belonging to the order Ophidia and the sub-order Viperinæ, and sometimes put in the same class with the true vipers or Viperidæ, which they closely resemble. Their only peculiarity is that of having large cavities behind and beneath the nostrils, between them and the eyes. In other respects, namely, in having two long poison-fangs; in the form of the head, broad behind and covered with scales, not plates; in the form of the jaws; in the manner of life, habits, &c., they are exactly the same. The most dangerous of the Ophidia belong to this family, above all those called rattle-snakes, which have long been known for the fatal effects of their poison. More than half of the species belong to America, and the remainder belong to the Indian Archipelago and Eastern Asia. They are divided into seven genera (sometimes into more), of which *Crotalus* and *Trigonocephalus* are the two principal ones.

CROTCHET. See MUSIC.

CROTON, a genus of plants of the order Euphorbiaceæ, comprehending a great number of species, many of them possessed of important medical properties. They occur as herbaceous plants, shrubs, and trees. The more remarkable species are *C. cascarilla*, with lanceolate, acute, and entire leaves, stalked, and downy on the under surface, and an arborescent stem. It is a native of the West Indies and Florida, and is one, if not the only, species which yields the cascarilla bark, much used in intermittent and nervous fevers, and in cases of indigestion; *C. lacciferum*, a native of the East Indies, said to furnish the finest of all the sorts of lac; and *C. tiglium*, which has an arborescent stem, ovate, smooth, acuminate, and serrated leaves, flowers in terminal spikes, and a smooth fruit of the size of a hazel-nut. It is an inhabitant of the East Indies, and in all its parts—wood, leaves, and fruit—possesses drastic purgative properties. The seeds furnish the well-known croton-oil (which see).

CROTONA, also CROTO, in ancient geography, a Greek republic in Magna Græcia or South Italy. Livy gives the circumference of the city of Crotona at 12 miles. This city was famous for producing the strongest *athletæ*, among them the celebrated Milo. It is still more celebrated as the city where Pythagoras settled between 540 and 530 B.C., and where he taught. Milo was one of his disciples. Under the Romans Crotona was infamous for its luxury and dissoluteness. Crotona is the modern Cotrone, and the ruins of the ancient town are still to be seen above Capo della Colonna.

CROTON-OIL is expressed from the seeds of an East Indian plant, the *Croton tiglium*. It is so strongly purgative that one drop is a full dose, and half a drop will sometimes produce a powerful effect. It is also found to produce the same effect when rubbed upon the tongue, or even upon the skin. It is so active that it should never be used but under the direction of an experienced physician. In the hands of such it is of great value, as its small bulk and insipid taste render it serviceable in cases in which no common medicine can be used, and its great power makes it operate when other medicines fail. It has been given to the extent of eight or ten drops in a bad case of ileus, which it cured without producing any bad symptoms. It should, however, be used with great caution. The proximate constituents of croton-oil have not been much investigated.

CROUP, a disease that mostly attacks infants, who are suddenly seized with a difficulty of breathing and a crouping noise. It is an inflammation of the mucous membrane of the windpipe, inducing the secretion of a very tenacious coagulable lymph, which lines the air-passages and impedes respiration. The croup does not appear to be contagious, whatever some physicians may think to the contrary; but it sometimes prevails epidemically. It seems, however, peculiar to some families; and a child having once been attacked is very liable to a return. It is confined to young children, and has never been known to attack a person arrived at the age of puberty.

Exposure to cold seems to be the general cause which produces this disorder, and therefore it occurs more frequently in the winter and spring than in the other seasons. It has been said that it is most prevalent near the sea-coast; but it is frequently met with in inland situations, and particularly those which are marshy. Some days previous to an attack of the disease the child appears drowsy, inactive, and fretful; the eyes are somewhat suffused and heavy; and there is a cough, which from the first has a peculiarly shrill sound; this, in the course of two days, becomes more violent and troublesome, and likewise more shrill. Every fit of coughing agitates the patient very much; the face is flushed and swelled, the eyes are protuberant, a general tremor takes place, and there is a kind of convulsive endeavour to renew respiration at the close of each fit. As the disease advances a constant difficulty of breathing prevails, and the head is thrown back in the agony of attempting to escape suffocation. There is not only an unusual sound produced by the cough (something between the yelping and barking of a dog), but respiration is performed with a hissing noise, as if the windpipe was closed up by some slight spongy substance. The cough is generally dry; but if anything is spit up, it has either a purulent appearance or seems to consist of films resembling portions of a membrane. Where great nausea and frequent retchings prevail, coagulated matter of the same nature is brought up. With these symptoms there is much thirst and an uneasy sense of heat over the whole body, a continual inclination to change from place to place, great restlessness, and frequency of the pulse. In an advanced stage of the disease respiration becomes more stridulous, and is performed with still greater difficulty, being repeated at longer periods and with greater exertions, until at last it ceases entirely.

The croup frequently proves fatal by suffocation, induced either by spasm affecting the glottis, or by a quantity of matter blocking up the air-passages; but when it terminates in health, it is by a resolution of the inflammation, by a ceasing of the spasms, and by a free expectoration of the matter exuding from the trachea, or of the crusts formed there. The disease has in a few instances terminated fatally within twenty-four hours after its attack; but it more usually happens that where it proves fatal it runs on to the fourth or fifth day. Where considerable portions of the membranous films, formed on the surface of the trachea, are thrown up, life is sometimes protracted for a day or two longer than would otherwise have happened. Dissections of children who have died of the croup have mostly shown a preternatural membrane lining the whole internal surface of the upper part of the trachea, which may always be easily separated from the proper membrane. There is likewise usually found a good deal of mucus, with a mixture of pus, in the windpipe and its ramifications.

The treatment of this disease must be conducted on the strictly antiphlogistic plan. It will first be right to give a nauseating emetic, ipecacuanha with tartarized antimony, or with squill, in divided doses; this may be followed up by cathartics, diaphoretics, digitalis, &c. Hot poultices ought to be applied near the affected part, and the child allowed to inhale the steam from a bucket of boiling water, or, what is better, bring steam into the middle of the room by means of a pipe connected with a kettle, which is to be kept boiling on the fire. Mercury carried speedily to salivation has in several instances arrested the progress of the disease when it appeared proceeding to a fatal termination. As the inflammation is declining it is very important that free expectoration should take place. This may be promoted by nauseating medicines, by inhaling steam, and by stimulating gargles, for which the decoction of seneka is particularly recommended. Where there is much wheezing an occasional emetic may in a considerable degree relieve the patient; and, under symptoms of threatening suffocation, the operation of bronchotomy has sometimes saved life. Should fits of spasmodic difficulty of breathing occur in the later periods of the disease, opium joined with diaphoretics would be most likely to do good. Napoleon, on the occasion of the death of his nephew, the Prince of Holland, of this disease, offered a premium of 12,000 francs for the best treatise on the croup. Of eighty-three essays which were presented to the committee of twelve members assembled for the examination at Paris, in 1811, two were acknowledged as the best—one by Jurine in Geneva, and the other by Albers of Bremen, between whom the prize was divided.

CROUSAZ, Jean Pierre de, a celebrated mathematician and philosopher, was born at Lausanne, April 13, 1663. He early distinguished himself by his progress in mathematics and philosophy under able professors at Geneva and Lausanne, applying himself particularly to the writings of Descartes, and to the reconciliation of the philosophical views of Descartes with those of Locke. In 1682 he went to the University of Leyden, and thence proceeded to Paris, where he became acquainted with the celebrated Father Malebranche, who, with other celebrated men, vainly endeavoured to convert him to the Catholic religion. On returning to his native town he was ordained minister, appointed honorary professor, and remained pastor of the church at Lausanne. Here also he taught mathematics and philosophy, and in 1724 he was appointed professor of the same subjects at the university at Groningen. In 1725 he was made an associate of the Academy of Sciences. He died in 1748 or 1750. He was one of the most prolific writers in France in the first half of the eighteenth century. The principal of his works are A System of Reflections that may contribute to the Illustration and Extension of Knowledge, or a New Essay on Logic; Summa Logica (1724); a Treatise on Education; Examination of Ancient and Modern Pyrrhonism; Geometry of Lines and Surfaces; Examination of Pope's Essay on Man; Commentary on the Translation of Pope's Essay by the Abbé du Resnel; a Treatise on the Beautiful; a Treatise on the Human Understanding.

CROW (*Corvus*, Linn.), a genus of birds remarkable for their gregarious and predatory habits, distinguished by the following characters:—The bill is straight, convex, and compressed, being covered at its base by incumbent bristly feathers; the upper mandible is curved at tip, the lower is a little shorter, carinated on both sides, and slightly ascending at the extremity; the nostrils are placed on the base of the bill, and are patulous, though covered by the incumbent feathers; the tongue is short, cartilaginous, acute, and bifid at tip; the tarsal bone a little longer than the femur; the toes are separated almost to the base, and the middle one is the longest; the nails are moderate, pointed, hollow beneath, and sharp-edged, the hind one being generally longest; the wings are subelongated, acute, the primaries separated when the wing is expanded, the first primary short, fourth and fifth longest; the tail consists of twelve feathers. The genus gives name to the family Corvidæ (which see), and includes, as British species, the carrion crow, the hooded or Royston crow, the raven, the rook, and the jackdaw, the last three of which are described under their respective heads.

The carrion crow (*C. corone*), or simply the crow, as it is frequently called, is very similar to the raven

in appearance and habits, though it is much smaller, being 18 or 19 inches in length, and about 36 between the tips of the wings. The plumage is compact and glossy, blue-black, with some greenish reflections; the female is similar to the male, but rather smaller. The favourite food of the carrion crow is carrion of all kinds, but it also preys upon small quadrupeds, such as young hares and rabbits, young birds, and various kinds of reptiles, especially frogs and lizards; and it is a confirmed robber of the nests of game birds and poultry, driving its bill through the eggs and carrying them off. Sometimes it proceeds to the sea-shore to feed upon mollusca, crabs, shrimps, &c., and has been observed to break the shell of a crab, by flying up in the air with it and letting it fall upon a stone. It attacks young lambs and sickly sheep, and, like the raven, delights to punch out the eyes of its unfortunate victims. The crow is not a gregarious bird, generally occurring solitary or in pairs, though a whole family remain together for some time after the young brood are able to fly. Little companies of ten or twelve often roost together at night, and bands of a like number are frequently seen in the winter time. The nest is built generally in a tall tree, remote from that of other birds, and is of considerable size. The foundation consists of sticks, rather loosely put together, and it is comfortably lined with withered grasses, the hair of cows and horses, and wool. The eggs are four to six in number, exceedingly variable in tint, but generally of a bluish-green, with blotches of brown. The carrion crow is easily tamed, and may be taught to articulate words.

The American crow (*C. Americanus*), though formerly thought to be identical with the European carrion crow, was separated into a distinct species by Audubon. It is smaller and less robust than the latter, and there are certain differences in the feathering of the two birds. 'There is probably no bird more generally and unjustly persecuted than the American crow; every farmer thinks himself privileged to destroy it, and counts the death of every one a gain to agriculture. Of course the bird, in order to save his race from extermination, must employ all his cunning and ingenuity to avoid his enemies; hence his extreme shyness and certain flight at the sight of any one carrying a gun. Perched on a high tree, he sounds the note of alarm at the approach of danger, and all the crows within half-a-mile fly off at the well-known cry. Thousands of crows are destroyed every year by means of nets, traps, and poisoned grain, and multitudes of the young birds are killed in their nests by every urchin that can climb a tree. Though the crow pulls up a few seeds of the germinating corn, his services to the agriculturist far outweigh his depredations; he daily devours insects, grubs, and worms, which but for him would devastate whole fields of the young corn; he destroys mice, moles, and other small quadrupeds, every one of which commits ten times the mischief he does; he will eat snakes, frogs, lizards, and other small reptiles, and also fruits, seeds, and vegetables, and, if hard pressed for food, will even descend to carrion. He will steal and devour the eggs of other birds, and will occasionally prey upon a weak or wounded bird; he delights to worry the owl, the opossum, and the racoon, and will pursue the thievish hawk, and even the eagle, with all the forces that he can raise in the neighbourhood. On the whole, the crow is a persecuted, comparatively harmless, and indeed a most serviceable bird, and deserves better treatment from the American farmer.' This crow is common in all parts of the United States, building its nest, which is similar to that of the European crow, in thick swamps, or in the sides of steep rocks. After the breeding season they assemble in great flocks. The American crow is easily tamed, and makes a very docile pet, but, like its congeners, is apt to pay little attention to the distinction between *meum* and *tuum*. The fish crow (*C. ossifragus*) is another American crow, resembling the preceding, but smaller, being 16 inches in length and 33 in extent of wings. It is abundant in the coast districts of the Southern States, and is sometimes seen as far north as New York. Its favourite food is fish, but it also eats all kinds of garbage, mollusca, &c. In winter its food is chiefly fruit, and it is then fat, and considered good eating.

The hooded, Royston, or gray-backed crow (*C. cornix*) is somewhat larger than the rook, being about 20 inches long and 39 between the points of the wings. Its head, wings, and tail are black, but less bright than in the rook; the rest of the body is a dull smoke-gray. Its food consists principally of eggs, young birds, and carrion and garbage of all kinds. Hooded crows are often found on the sea-shore, where they feed upon such animal matter as may have been left by the tide, and upon mussels, cockles, and limpets. 'They also prowl about the preserves, warrens, and pastures, and if they find any animal in a disabled or weakly state they punch out its eyes; and if they are not able to kill it on the spot, leave it to perish, and return to the carrion at their leisure. In the north they carry on similar depredations during the whole summer. The number of eggs and young birds of grouse and other species which they destroy is very great; and in some places of the Highlands and the northern isles, and especially in the Faroe Islands, they rob the ground of the seed-corn and seed-potatoes' (Mudie). The hooded crow is common in Scotland and Ireland, but less so in England, where it is chiefly a winter visitant. Its nest is similar to that of the carrion crow, and is built in trees or rocks. The distinctness of the species *C. corone* and *C. cornix* has been with justice called in question: for in all parts of the country they breed freely together, and the young of the same nest present more or less resemblance to the one or the other parent.

CROWBERRY, or CRAKEBERRY (*Empetrum nigrum*), a plant resembling the heaths, which derives its generic name from growing on rocks and elevated stony mountains. The berry is jet black. This plant is common in all the northern parts of Europe, including the moors of Scotland and the north of England. It is found in elevated situations on dry, barren, moorish, or boggy soils, and is more patient of cold bleak atmospheres than even the common heath. The berries have a slight subacid taste, and are eaten by children in the Highlands, and also by the Russian peasants. The Kamtschadales gather great quantities of them to boil with their fish, or to make a sort of pudding with the roots of their lilies. Wild game, especially grouse, feed on them. They afford a purple dye; and, boiled with fat, are used for imparting a black colour to otter and sable skins. The plant formerly called *Empetrum album*, which grows in Portugal, and the fruit of which is a white drupe, has been erected by Don into a separate genus. The red crowberry (*Empetrum rubrum*), which has a red fruit, grows in the neighbourhood of the Straits of Magellan.

CROW-BLACKBIRD. The blackbirds, or crow-blackbirds of America, are quite different from the European blackbird, and are more nearly allied to the starlings and crows. They form the genus *Quiscalus*, and belong to the family *Sturnidæ*. The great crow-blackbird (*Q. major*) is 16 inches long, having a most glossy black plumage; the tail is cuneiform, and when the wings are folded they extend nearly 5 inches beyond it. The female is of a light-brown

colour above, and whitish beneath. This species is found in the Southern States of America, principally along the sea coast: it also inhabits Mexico, and is said to be common in the West Indies. The purple grakle, lesser or common crow-blackbird (*Q. versicolor*), is similar in colour to the preceding, but smaller. On their first arrival in the Middle States of America from the south, which is in the latter part of March, they come in scattered flocks, and are most frequent in swamps, meadows, and recently ploughed ground. At this season they consume an immense number of destructive insects, and if they continued to feed on such food they would be among the farmer's chief benefactors. Towards the beginning or middle of April they begin to build upon the tall pines or cedars nearest to their feeding grounds. As many as ten or fifteen nests have been found on the same tree. The eggs are of a bluish-olive hue, with large spots, and irregular streaks of dark-brown. The period when the green blade of the young Indian corn begins to sprout above the surface of the ground is that in which the common crow-blackbird commences its ravages. Vast flocks, chattering and screaming, as if anticipating the pleasures of the feast, descend upon the soil, and pluck up the swelling grain. In a few hours the farmer beholds his fair prospect of an ample harvest almost destroyed, and that, too, with but little chance of his being able to remedy the evil. It is true that the guns are commonly put in requisition, and a few volleys fired among these insolent thieves destroy a small part of their numbers. But they only change their place to other parts of the field, and return ere long to renew the assault with increased activity. It is not until the month of November that they begin to collect their forces, now renovated and augmented by their young, to seek the genial climate of the south for the winter.

CROWFOOT. See RANUNCULUS.

CROWLAND, or CROYLAND, a town in England, in the county of Lincoln, 8½ miles north of Peterborough; pop. in 1871, 2459. It consists of four principal streets, connected by a very curious ancient bridge, on one of the wings of which there is a dilapidated statue, attributed to the ninth century, and supposed to be that either of Alfred or Ethelbald, king of Mercia. The only other remarkable edifice is the parish church, forming part of the extensive ruins of an abbey built by Ethelbald. Ingulphus, to whom a history of the Abbey of Crowland, first published at London in 1596, afterwards at Oxford in 1684, has erroneously been attributed, was Abbot of Crowland from 1075 till 1109.

CROWN. In the early ages, when men were fond of expressing all their feelings by outward signs, a wreath of flowers or leaves was naturally one of the first emblems of honour or of joy. Such was the ornament of the priest in the performance of sacrifice, of the hero on his return from victory, of the bride at her nuptials, and of the guests at a feast. The ancient mythology, which gave everything a distinct beginning and a poetical origin, ascribes the invention of wreaths to Prometheus, who imitated with flowers the fetters which he had borne for his love to mankind, whom he had created. According to Pliny, wreaths were first made of ivy, and Bacchus first wore them. In process of time they were made of very various materials. Those worn by the Greeks at feasts in honour of a divinity were made of the plant consecrated to the god. Wreaths of roses afterwards became very common. In some cases wreaths were even made of wool. Wreaths of ivy and parsley were worn by the Greeks on the head, neck, and breast at entertainments, with a view to prevent drunkenness. Mnesitheus and Callimachus, two Greek physicians, wrote entire books on wreaths, and their medical virtues. Corpses were covered with wreaths and green branches. Lovers adorned with wreaths and flowers the doors of their mistresses, and even captives who were to be sold as slaves wore wreaths, hence the phrase, 'sub corona venire or vendere.' The beasts sacrificed to the gods were also crowned. Wreaths, in process of time, were made of metal, in imitation of flowers, or of the fillet which the priest wore round his head when he sacrificed, which was called *diadēma*. This attribute of distinction was early adopted by the kings, when they united in their persons the temporal and spiritual power. Among the various crowns and wreaths in use among the Greeks and Romans were the following:—

Corona agonothetarum, the reward of the victor in the great gymnastic games. The wreaths conferred at the great games of Greece were of different kinds; at the Olympic games, of wild olive; at the Pythian games, of laurel; at the Nemean games, first of olive branches, then of green parsley; at the Isthmian games, a wreath of pine leaves, afterwards of ivy; subsequently pine leaves were resumed.

Corona aurea (the golden crown), the reward of remarkable bravery.

Corona castrensis, given to him who first entered the camp of the enemy.

Corona civica (see CIVIC CROWN), the second in honour of the crowns bestowed by the Romans for military achievements. It was given to him who had saved the life of a Roman citizen in battle.

Corona convivalis, the wreath worn at feasts.

Corona muralis, given by the general to the soldier who first scaled the enemy's wall. It was made of gold, and embattled above.

Corona natalitia, a wreath which parents at Athens and Rome hung up before the door at the birth of a child. At Athens it was made of olive branches if the child was a boy, and of wool if a girl.

Corona navalis, the next in rank after the civic crown, was given to him who first boarded and took an enemy's vessel. Like the *corona muralis* it was made of gold. It is not known whether the *corona rostrata* was the same with this one, or one which conferred a still higher honour.

Corona nuptialis, a crown or wreath worn by brides. The bridegroom also, and his relations, on the day of his wedding, adorned themselves with wreaths. At first the *corona nuptialis* was of flowers plucked by the bride herself; afterwards of gold or silver and precious stones.

Corona obsidionalis, a reward given to him who delivered a besieged town or a blockaded army. It was the highest military honour among the Romans, and the most difficult to be obtained. It was made of grass, or weeds and flowers; if possible, of such as grew on the delivered place.

Corona triumphalis, a wreath of laurel which was given by the army to the *imperator*. He wore it on his head at the celebration of his triumph. Another crown (made of gold), which was also presented by the army to a general holding a triumph, being too massive to be worn, was carried over the head of the general during his triumph. A third crown (also a golden one, and of great value) was received by the general from the provinces.

In the middle ages crowns became exclusively appropriated to the royal and imperial dignity; the coronets of nobles were only borne in their coats of arms. (See CORONET, also TIARA.)—*Crown* is used figuratively for the royal power, in contradistinction either to the person of the monarch or to the body of the nation, with its representatives, interests, &c. Thus, in modern times, the word *crown* is used to express the rights and prerogatives of the monarch

considered as a part of the state, which includes all powers—the legislative, judicial, &c. Thus the crown domains are distinguished from the state or national domains. In France a difference was made between the crown domains and the private domains of the sovereign; the former were inalienable, and belonged to the reigning monarch, whilst the second might be treated like any other private property. The distinction between crown and state, of course, does not exist in perfectly arbitrary governments.

CROWN, in an ecclesiastical sense, is used for the tonsure, the shaven spot on the head of the Roman Catholic priests where they receive the ointment of consecration. See TONSURE.

CROWN, the name of a silver coin still current in England, though no longer coined, the last having been struck in 1851. It is equal in value to five shillings or the fourth of a pound. In 1847 and 1848 some pattern crowns were struck with a gold centre, but the experiment was carried no further.

CROWN, in heraldry. See HERALDRY.

CROWN DEBTS, debts due to the crown, whose claim ranks before that of all other creditors, and may be enforced by a summary process called an extent. The existence of crown debts created or secured before June 4, 1839, may be ascertained by search at the Exchequer Office and the Tax Office, after that date at the Crown Pleas Office. (Wharton's Law Lexicon.)

CROWN-GLASS, the best kind of window-glass, the hardest and most colourless, is made almost entirely of sand and alkali and a little lime, without lead or any metallic oxide except a very small quantity of manganese, and sometimes of cobalt. Crown-glass is used in connection with flint-glass for dioptric instruments, in order to destroy the disagreeable effect of the aberration of colours. This important discovery by Dollond, who turned it to admirable account in the achromatic telescope, was carried to the highest perfection by Reichenbach. See GLASS.

CROWN IMPERIAL. See FRITILLARIA.

CROWN LANDS, the demesne lands belonging to the crown. These are now usually surrendered to the country at the beginning of every sovereign's reign in return for an allowance fixed at a certain amount for the reign by Parliament. They are placed under commissioners, and the revenue derived from them becomes part of the consolidated fund. In the year 1871–72 the net revenue of the crown lands amounted to £755,000. See CIVIL LIST.

CROWN OFFICE. The Court of Queen's Bench is divided into the *plea side* and the *crown side*. In the plea side it takes cognizance of civil causes; in the crown side it takes cognizance of criminal causes, and is thereupon called the *crown office*. It has the right of removing any case from an inferior court to be tried before its own bar by a writ of *certiorari*, and can also stay proceedings in an inferior court by a *prohibition*. It may likewise issue a *mandamus* to compel a magistrate or other official to do his duty in a particular case, and from it also proceed writs of *habeas corpus*, &c. In the crown office are exhibited informations in the name of the king, of which there are two kinds: 1, those which are truly the king's own suits, and filed, *ex officio*, by his own immediate officer, the attorney-general; 2, those in which, though the king is the nominal prosecutor, yet some private person, as a common informer, is the real one; these are filed by the king's coroner and attorney, usually called *master of the crown office*.

CROWN SOLICITOR, in England, the solicitor to the treasury, who instructs counsel in all state prosecutions. In Ireland, an officer attached to each circuit, paid by a salary, whose duty it is to take charge of every case for the crown in criminal cases. His office thus corresponds in some measure with that of the procurators-fiscal in Scotland. There are no such officers in England.

CROYDON, a town in England, in the county of Surrey, on the border of Banstead Downs. The houses are mostly substantial, and often handsome, and the town is surrounded by fine villas, mansions, and pleasure-grounds. The church, a fine old building of freestone and flint, in the later English style, with a lofty embattled tower, was destroyed by fire in 1867, only the tower being left standing. It contained many fine and interesting monuments, some of which were destroyed and others injured. The charities include an hospital most munificently endowed by Archbishop Whitgift. The principal trade of the place is in corn; there are also several breweries. One of the most interesting objects in Croydon is the remains of the ancient archiepiscopal palace, for a long time the chief residence of the Archbishops of Canterbury, but given up as a residence in 1807. It was originally built of timber, but no part of the present structure is older than the fourteenth century. The salubrity of the air, the short distance from the metropolis, and the easy conveyance by the London and Brighton Railway, which has a station here, make Croydon a favourite retreat of merchants and retired tradesmen. Croydon doubled its population between 1851 and 1861, and nearly doubled its population between 1861 and 1871; and the aspect of the place has necessarily been much changed in recent years. The drainage of the town has been very efficiently carried out, and the sewage is employed in irrigation. New water-works were completed in 1868, the water of which is supplied by an artesian well. Pop. in 1861, 30,240; in 1871, 55,652.

CROZAT, JOSEPH ANTOINE, Marquis Duchâtel, born in 1696, at Toulouse, a great lover and collector of works of art, inherited a large fortune from his father (who was a financier during the last years of the reign of Louis XIV.), was counsellor of the parliament of Toulouse, and subsequently reader to the king. The whole of his life was dedicated to the works of art which he had collected, and to the artists who wished to profit by them. The sketches in his collection exceeded 19,000, and he had expended above 450,000 livres in this particular branch. During the sixty years which he employed in collecting, no cabinet was sold in any part of Europe of which some part was not purchased by him. Crozat went to Italy in 1714, for the purpose of increasing his collection. He was also presented with several valuable collections. His cabinet of antiques and sculpture, particularly gems, was equally valuable, and contained 1382 cameos and intaglios. This treasure became more famous from the description which Mariette gave of it. On Crozat's death, in 1740, his collection came into the possession of his brother, the Marquis Duchâtel, after whose death most of the articles of vertu were dispersed. The greater part of the picture-gallery passed to Crozat's nephew, Baron Thiers, from whose heirs it was purchased by the Empress of Russia. See Mariette's Description sommaire des Collections de M. Crozat.

CROZET ISLANDS, a group of four, in the South Indian Ocean, between Kerguelen and Prince Edward Islands, about lat. 46° 27′ S.; lon. 52° 14′ E. They are all of volcanic origin, and the most easterly of them, called East Island, presents precipitous cliffs to the sea, and has lofty peaks, exceeding 4000 feet. The largest, called Possession Island, is believed to be about 20 miles long by 10 broad, and though unapproachable on its west, has three bays on its east side where ships may anchor.

CRUCIBLE, a vessel employed to hold substances which are to be submitted to a high temperature

without collecting the volatile products of the action. It is usually of a conical, circular, or triangular shape, closed at the bottom and open at the top, and is made of various materials, sometimes simply of fireclay, as in ordinary English crucibles; sometimes of a mixture of fireclay and a powder of the same substance, previously baked, as in the Hessian crucibles; and sometimes of a mixture of fireclay and plumbago, as in what are called blue-pots or black-lead crucibles. For delicate chemical operations crucibles of the best quality of porcelain are much used. Various metals are also employed in their construction. The most valuable are those of platinum, which are infusible at the highest furnace temperatures, and are not affected by acids, though alkalies, sulphides, easily reduced metals, nitrates, chlorates, and some other bodies injure or dissolve them.

CRUCIFERÆ, a family of plants, so named from having a corolla of four petals arranged in the form of a cross. The stamens are four long and two short, hence named tetradynamous; fruit a siliqua, or pod with two valves opening lengthwise, as in wall-flower; or a silicula, a short pod, with the partition in its broadest diameter, and with flat or concave valves, as in whitlow-grass; or a short pod with the partition in its narrow diameter, as in shepherd's purse; or a pod divided by transverse partitions, each division containing a single seed, as in radish. There are no poisonous plants in this order. It includes the cabbage, cauliflower, turnip, radish, cress, horseradish, &c. Wall-flower, stock, rocket, and honesty are amongst the garden flowers belonging to this order. The Cruciferæ are widely dispersed. Many, like the scurvy-grass (*Cochlearia officinalis*), are antiscorbutic. The scurvy-grass ranges over the arctic and sub-arctic shores and alpine regions of Western Europe, Northern Asia, and North America.

CRUCIFIX, a cross bearing the figure of Christ. It cannot be said at what time this emblem of the Christian faith began to be used, either by the Christian church or by individual Christians. A general feeling of repugnance towards the instrument of punishment which, among the Romans, was reserved only for the most infamous class of criminals, would for a long time prevent the early Christians from representing Christ upon the cross, and this feeling would have to be conquered before the crucifix could come into use in public worship. There are certain remains which would seem to show that crucifixes existed in the beginning of the third century; but it is probable that all these were merely tokens of individual piety. It is certain that the most ancient crucifixes known to exist belong to this class. Such, for example, is that painted in the Syriac evangelistary of the year 582, contained in the Laurentian Library at Florence; and such also is the pectoral cross of the superiors of Monza, which is said to have been a gift of Pope Gregory the Great to Theodolinda, who founded the cathedral. Crucifixes appear to have been first used in public worship towards the end of the sixth century. The most ancient example known of a crucifix used for this purpose is one which, on the testimony of St. Gregory of Tours, was painted in a church at Narbonne. For more than a hundred years after this period they were still rare, and it was not till after the Trullan Council, held at Constantinople in 692, which ordained that historic painting should be preferred to emblems, that the images of Christ crucified began to multiply. As to the manner of representing Christ on the cross it appears to be unquestionable that, as a rule, the figures on the most ancient crucifixes were engraved on gold, silver, or iron crosses. On the pectoral cross of Monza, however, the figures are enamelled on a gold cross. At a later period they were painted on wood, and it is only in the ninth century, in the pontificate of Leo III., that the figure of Christ appears carved upon the cross in bass-relief. Although there can be no doubt that Christ, in accordance with the Roman custom, was crucified naked, all the most ancient crucifixes, almost without exception, represent him as clothed with a tunic reaching down to the feet. This practice lasted down to the eighth century, when it began to be modified, the body of Christ being no longer covered above the loins; and at length it became the custom to represent Christ, as in the crucifixes of the present day, entirely naked with the exception of a cloth about the loins. Another point in which the ancient crucifixes differ from modern ones is as to whether Christ is represented dead or alive. Until the eleventh century he is represented alive, since that period he has been represented as dead. The first example of Christ being represented as dead is furnished by a manuscript in the Laurentian Library at Florence, belonging to about the year 1059. In the earlier crucifixes, also, the number of nails by which Christ is fixed to the cross is four, one through each hand and each foot, while in the more modern ones there are only three nails, one foot being laid above the other and a single nail driven through both. Many crucifixes bear also the inscription put upon the cross by the order of Pilate, but this is always found in an abbreviated form, both in ancient and modern times. In the Latin Church it is frequently omitted, but the Greek Church have adhered more strictly to this practice. Various accessories are also sometimes found in crucifixes, such as figures of the sun and moon, of the Virgin Mary and St. John, of the two soldiers—one presenting the vinegar for Christ to drink, the other with the lance with which he pierced the side of Christ; emblematical figures representing the four evangelists; angels in a posture of adoration, &c. &c.

CRUCIFIXION, a mode of inflicting capital punishment, by affixing criminals to a wooden cross. This was a frequent punishment among the ancients, and practised by most of the nations whose history has reached our knowledge. It is now chiefly confined to the Mohammedans. There were different kinds of crosses, such as that most familiar to us, consisting of two beams at right angles, and St. Andrew's cross, though it cannot be affirmed which was in general use. On condemnation, the criminal, by aggravated barbarity, was scourged before suffering death; and perhaps this part of his punishment was scarcely inferior to the other. The scourge was formed of cords armed with bits of lead or bone, or it consisted of simple rods of iron and wood, which latter were called *scorpions*, when covered with spines. While he suffered he was bound to a column. This was the common custom, and preceded not only crucifixion, but other kinds of capital punishment. The peculiarity of Pilate's scourging was that he inflicted it iniquitously, while declaring the sufferer innocent.

The criminal was compelled to carry his own cross to the place of execution, which was generally at some distance from the habitations of men. A certain gate had its specific name from being the exit of criminals on the way to punishment. It was not the whole cross, according to some, which was borne by the offender, but only the transverse beam, because they suppose the upright part to have remained stationary in the ground, whereas the other was movable. The criminal, having reached the fatal spot, was stripped naked, and affixed to the cross by iron spikes driven through the hands and feet, or through the wrists and ankles. That the weight of the body might be the better supported, the arms and

legs were sometimes encircled by cords; sometimes also a support was affixed to the lower part of the cross for the feet to rest on. If, instead of being nailed to the cross, the criminal was bound to it by cords, it was designed as a more cruel punishment. The criminal, being fixed on the cross, was left to expire in anguish, and his body remained a prey to the birds of the air. His death, however, was not immediate, nor should it be so in general, considering that the vital organs may escape laceration. We learn from the distinct narrative of the evangelists that conversations could be carried on among those who suffered, or between them and the by-standers; and Justin, the historian, relates that when Bomilcar, a Carthaginian leader, had been crucified on an accusation of treason against the state, he bore the cruelty of his countrymen with distinguished fortitude, harangued them from the cross as from a tribunal, and reproached them with their ingratitude, before he expired. There are repeated instances of persons crucified having perished more from hunger than from the severity of the punishment, there being cases on record of persons living for nine days on the cross. By the Mohammedan laws certain delinquents are to be punished with crucifixion, and killed on the cross by thrusting a spear through their bodies; and here we find an example of what is narrated in scripture of a soldier piercing the side of Jesus Christ with a lance, though he was dead. That spectators might learn the cause of punishment, a label or inscription indicating the crime frequently surmounted the head of the criminal. The offence charged against Jesus Christ was having called himself King of the Jews. Accordingly the inscription on his cross was, 'This is Jesus, the king of the Jews.' That the object of crucifixion might be fulfilled in exposing the body of the criminal to decay, sentinels were commonly posted beside the cross, to prevent it from being taken down and buried. Privation of sepulture was dreaded as the greatest evil by the ancients, who believed that the soul could never rest or enjoy felicity so long as their mortal remains continued unburied. Thus it was a great aggravation of the punishment.

Besides these, the ordinary modes of inflicting the punishment of crucifixion, assuredly sufficiently cruel in themselves, mankind have sought the gratification of vengeance in deviating from them. Such was the conduct of the Roman soldiers, under Titus, at the siege of Jerusalem, where the miserable Jews were crucified in various postures by their sanguinary enemies. Seneca speaks of crucifixion with the head downwards: and of this we have a noted example in the history of St. Peter, during the first century of the Christian era. Having been seized by the Roman government, and condemned to die on the cross, it is said that he solicited, as a greater degradation, that he might be crucified with his head downwards. It appears that delinquents were sometimes affixed to the cross, and burned or suffocated to death. With respect to the persons on whom this punishment was inflicted, we have seen that the Carthaginian leaders were not exempt from it; but elsewhere, especially among the Jews and Romans, only the lowest malefactors were condemned to the cross. It was peculiarly appropriated for slaves.

The cross was sometimes employed by the ancients as a terrible instrument of destruction to a vanquished enemy. Thus Alexander the Great, after putting 8000 or 10,000 Tyrians to the sword, on taking their city, crucified 2000 more along the shores. Not less sanguinary was the vengeance of the Romans against the Jews; Minutius Alexander crucified 800, and Quinctilius Varus 2000, on account of some revolt. Titus whom we are wont to esteem as humane and merciful, crucified above 500 in a day; and at the sack of Jerusalem, under his command, the Romans, wherever they could seize the affrighted fugitives, either in hatred or derision nailed them to crosses about the walls of the city, until the multitude was so great that room was wanting for the crosses, and crosses for the bodies.

CRUDEN, ALEXANDER, author of the Concordance to the Scriptures, was born at Aberdeen in 1700 or 1701, and was the second son of William Cruden, a merchant and bailie of that town. He appears to have been originally intended for the church, and took the degree of M.A. at Marischal College. He quitted his native town in 1722 and proceeded to London, where he was employed as tutor in several families. He afterwards spent some years in the same capacity in the Isle of Man; but, previous to the year 1732, again returned to the metropolis, where he opened a bookseller's shop under the Royal Exchange, and was also employed as a corrector of the press. In 1735 he was appointed bookseller to Queen Caroline. His great work, on which he had been employed for a considerable time previously, appeared in 1737, under the title of A Complete Concordance of the Holy Scriptures of the Old and New Testament. In a pecuniary point of view it was not at first successful, and the embarrassments to which it reduced the author caused a return of a mental malady, symptoms of which had previously manifested themselves, and which now occasioned his being sent by his friends to a lunatic asylum at Bethnal Green. After his release he instituted an action of damages against those who had confined him, and published an account of his confinement under a whimsical title. In 1753 he was again placed in confinement, and again, on being liberated, published an account of his case. In 1769 he visited his native town of Aberdeen, and after remaining about a year there he returned to London, where shortly afterwards he died in his lodgings, Camden Street, Islington, on 1st November, 1770. Of Cruden's great work, the Concordance, three editions appeared during his life. The pains which he took with it were prodigious, constructing it anew from the foundation, without availing himself of the labours of his predecessors, and verifying personally the accuracy of each quotation and reference. Cruden was also the author of an index to Bishop Newton's edition of the Works of Milton; A Scripture Dictionary, or Guide to the Holy Scriptures, printed at Aberdeen shortly after his death; and The History and Excellency of the Scriptures, prefixed to the Compendium of the Holy Bible.

CRUISERS, in naval affairs, vessels, as the name imports, employed on a cruise. The name is commonly given to men-of-war made use of to secure merchant ships and vessels from the enemy's small frigates and privateers. They are generally formed for fast sailing, and well manned.

CRUIVE, a kind of trap used in rivers for catching salmon, made of stakes or hecks, with a large opening by which the salmon may enter but by which they cannot escape, and with smaller openings between the stakes large enough to allow young salmon to escape freely. Regulations with regard to cruives are contained in a schedule to the Salmon Fisheries Act of 1868 (31 and 32 Vict. cap. cxxiii.)

CRUSADES are the wars which were carried on by the Christian nations of the West, from the end of the eleventh till the latter half of the thirteenth century, for the conquest of Palestine. They were called *Crusades* because all the warriors who followed the holy banner (*Crusaders*) wore the sign of the cross. The Christian and Mohammedan nations had been during a long period, in a state of war, not only in

Asia, but also in Europe, where the Moors, Mohammedans by religion, had taken possession of part of the Spanish peninsula. The nations of the west were grieved that the Holy Land, where Jesus had lived, taught, and died for mankind, where pious pilgrims resorted to pour out their sorrows and ask for aid from above, at the tomb of their Saviour, should be in the power of unbelievers. The pilgrims, on their return, related the dangers they had encountered. The Caliph Hakem was particularly described as a second Nero. Being the son of a Christian woman, he shed the blood of Christians without mercy, to prevent the suspicion of his being secretly attached to that religion. These representations kindled the religious zeal of Christian Europe into a flame, and a general ardour was awakened to deliver the sepulchre of Christ from the hands of the infidels. In order to understand this general excitement, we must remember that, at this period, the confusion and desolation which had followed the irruption of the barbarians into the south and west of Europe had ceased, and the dawn of civilization and intellectual cultivation had commenced. In this mental twilight men were just in a state to receive a strong religious excitement. The idea of the Virgin, too, harmonized well with the Teutonic reverence for the female sex; and to fight in her cause was gratifying to the spirit of chivalry. The undisciplined minds of men were bent upon adventure, and their imaginations were easily roused by the reports of the riches of the East. The joys of paradise were promised to all who should fall in the holy cause. Thus a crowd of the strongest feelings, chivalrous devotion to the female sex, the hope of adventure, of wealth, of honour, and of heaven, stirred up the spirit of Europe, and impelled her sons into the East. The pope considered the invasion of Asia as the means of promoting Christianity amongst the infidels, and of winning whole nations to the bosom of the church: monarchs expected victory and increase of dominion; the peasant, who, in the greater part of Europe, was struggling with wretchedness in the degrading condition of bondage, was ready to follow to a country which was pictured as a paradise. The East has always had a poetical charm for the people of the West, which has by no means ceased in our time. The Crusades, and the ardour with which whole nations engaged in them, must be attributed to the above causes.

Peter of Amiens, or Peter the Hermit, was the immediate cause of the first Crusade. In 1093 he had joined other pilgrims on a journey to Jerusalem. On his return he gave Pope Urban II. a description of the unhappy situation of Christians in the East, and presented a petition from the patriarch of Jerusalem, in which he anxiously entreated the assistance of the western Christians for their suffering brethren. The pope disclosed to the council which was held at Piacenza in March, 1095, in the open air, on account of the number of people assembled, the message which Christ had sent through Peter the Hermit, caused the ambassadors of the Greek emperor Alexius to describe the condition of Christianity in the East, and induced many to promise their assistance for the relief of their oppressed brethren. The sensation which he produced at the council assembled at Clermont in Nov. 1095, where ambassadors from all nations were present, was still greater. He inspired the whole assembly so completely in favour of his plan that they unanimously exclaimed, after he had described the miserable condition of the oriental Christians, and called upon the West for aid, *Deus vult* (It is God's will)!

In 1096 numberless armies went forth in different divisions. This is considered the first Crusade. Many of these armies, being ignorant of military discipline, and unprovided with the necessaries for such an expedition, were completely destroyed in the different countries through which they had to pass before reaching Constantinople, which had been chosen for their place of meeting. A superficial knowledge of these holy wars throws a false glare round the character of the crusading armies. They contained, indeed, some men of elevated character; but the greater part consisted of crazy fanatics and wretches bent on plunder. A well-conducted regular army, however, of 80,000 men was headed by Godfrey of Bouillon, duke of Lower Lorraine; Hugh of Vermandois, brother to Philip, king of France; Baldwin, brother of Godfrey; Robert II. of Flanders; Robert II. of Normandy, brother of William II., king of England; Raymond of Toulouse; Bohemond of Tarentum, son of Robert Guiscard; Tancred of Apulia, cousin of Bohemond; and other heroes. With this army the experienced commanders traversed Germany and Hungary, passed over the Strait of Gallipoli, and conquered Nicæa in June, 1097. Shortly after, on the 4th of July, the Crusaders met an eastern army in a pitched battle for the first time. This was at Dorylæum, where, after a severe contest, the Crusaders were completely victorious, and the Turkish army put to flight. The Crusaders now marched through Asia Minor upon Antioch, which, with the exception of the citadel, fell into their hands by treachery on the 3d of June, 1098. Before they could capture the citadel they had themselves to stand a siege in Antioch, a Turkish army having advanced and surrounded the town soon after its capture by the Crusaders. In three weeks' time the Crusading army was reduced to the most pitiable condition; but on the 28th of June they sallied out in battle array, and succeeded, famished and exhausted as they were, in completely routing the well-equipped Turkish army. Meanwhile Baldwin, who had separated from the main army while it lay encamped on the banks of the Orontes, had proceeded eastwards towards Edessa, then in the possession of a Christian prince who maintained himself with difficulty against the neighbouring Mohammedan emirs, and concluded a treaty with him by which he agreed to aid him against his Mohammedan foes, on condition that he himself should be his successor on his death. This treaty was concluded in Feb. 1098; and soon after the Prince of Edessa was killed in a popular insurrection, when Baldwin made good his claims to succeed him, and soon made himself ruler of an extensive territory stretching over the Armenian mountains and the plain of Mesopotamia. The Crusaders remained nearly a year in the neighbourhood of Antioch; but at last, in May, 1099, the march against Jerusalem was begun. The siege of this city was commenced by the Crusading army, now reduced to little more than 20,000 men, early in June; and finally, after terrible contests and the most violent exertions on the part of the besiegers, it was taken, after a two days' storm, on the 15th of July. Godfrey of Bouillon was chosen king of Jerusalem, but refused 'to wear a king's crown on the spot where the Saviour of the world had worn a crown of thorns,' and preferred to style himself Protector of the Holy Sepulchre. Godfrey died in 1100, and was succeeded by his brother Baldwin, who did not scruple to accept the title which Godfrey had refused. The news of the conquest of Jerusalem renewed the zeal of the West. In 1102 an army of 260,000 men left Europe, which, however, perished partly on their march, and partly by the sword of the Sultan of Iconium. The Genoese and other commercial nations undertook several expeditions by sea. The second great and regularly-conducted Cru-

sade was occasioned by the loss of Edessa, which the Saracens conquered in Dec. 1144. The news of this loss produced great consternation in Europe, and it was apprehended that the other acquisitions, including Jerusalem, would fall again into the hands of the infidels.

In consequence of these fears Pope Eugenius III., seconded by St. Bernard of Clairvaux, exhorted the German emperor Conrad III., and the king of France, Louis VII., to defend the cross. Both these monarchs obeyed the call in 1147, and led large bodies of forces to the East; but their enterprise was not successful, and they were compelled to withdraw, leaving the Kingdom of Jerusalem in a much weaker condition than they had found it. They returned to Europe in 1149.

When Sultan Saladin in 1187 took Jerusalem from the Christians, the zeal of the West became still more ardent than at the commencement of the Crusades; and the monarchs of the three principal European countries—Frederick I. (Barbarossa), emperor of Germany; Philip Augustus, king of France; and Richard I. (Cœur de Leon), king of England—determined to lead their armies in person against the infidels. This is regarded as the third Crusade. The army of Frederick assembled at Ratisbon in the spring of 1189, and marching along the Danube through Austria and Hungary, forced its way through the Byzantine Empire, and embarked at Gallipoli for Asia Minor. At Philomelium (now Finiminum), about 23 miles from Iconium, Frederick found an innumerable Turkish army assembled to oppose him, and a bloody battle ensued (May 7, 1199). The attacks of the Turks were frequently renewed during the day, but without success, and under cover of night they made their escape from the battlefield. After this victory Frederick continued his march through Asia Minor, and had already reached Seleucia when his sudden death by drowning in the waters of the Kalykadnus (Selef) crippled and almost immediately put an end to the expedition (June 10). His son Frederick, duke of Suabia, was now chosen leader of the army, and with the small remains of it he reached Acre on the 8th of October, and took part in the siege of that fortress, which had already been begun. But when he also was carried off by disease on the 20th of Jan. 1191, the rest of the German army dwindled away, and the expedition thus came to an end. The other two who took part in this third Crusade—Richard of England and Philip Augustus of France—had in the meantime met at Vezelai in June, 1190, and agreed to unite their forces at Messina in Sicily. Here they spent six months at the end of 1190 and the beginning of 1191. Philip was the first to sail thence for the Holy Land; and on the day before Easter (April 13, 1191) he joined the other Crusaders before Acre, who had already arrived there from various Italian ports. Richard was not so fortunate. Soon after leaving Sicily his fleet encountered a violent storm, and many of the vessels were driven out of their course to the island of Cyprus, and one of these contained his mother and Berengaria of Navarre, to whom he had been betrothed in Sicily. The island of Cyprus was then an independent kingdom subject to Isaac, a prince belonging to the Byzantine imperial house of the Comneni. This prince was despotic, cruel, and avaricious. All strangers landing on the island, and all who were shipwrecked on its coasts, were treated by him as enemies; and the English knights who had been compelled to take shelter in the island were put in chains and robbed of their property. Even the ladies of the royal household were in danger of being conveyed to the castle of the king, when Richard himself, who had been driven to the island of Rhodes, arrived, and ultimately succeeded in taking Isaac and his daughter prisoners, whereupon he caused himself to be recognized as King of Cyprus. (He afterwards made over the island to Guy of Lusignan on condition of his renouncing his claim to the title of King of Jerusalem.) It was not till the 8th of June that he reached Acre to take part in the siege of that fortress, which was still going on. Little more than a month after his arrival Acre surrendered (June 12). The Christian camp was now torn by dissensions. Richard and Philip Augustus, who had never been very friendly allies, were each jealous of the honours paid to the other, and within a few weeks after the fall of Acre the French king returned to Europe. Richard thus became recognized as the sole leader of the expedition; and it was chiefly in the battles, sieges, and forays which ensued that he acquired that reputation for personal valour and prowess for which he is celebrated in romance and song, and which secured him the title by which he is generally known. He did not, however, exhibit the same ability as a general as he did as a combatant on the field of battle. Although nearly always victorious in his engagements with the enemy, his enterprises can scarcely be regarded as successful. He defeated Saladin at Adsoof, and soon after occupied Jaffa or Joppa; but having twice set out with the design of besieging Jerusalem, he retired both times without effecting his purpose; and at last despairing of ever accomplishing the object of the Crusade, he concluded a truce of three years and three months with Saladin, who agreed that pilgrims should be freely permitted to visit the Holy Sepulchre, and that the whole seacoast from Tyre to Jaffa (including the fortress of Acre), together with half the district between Ramlah and Lidda, should belong to the Crusaders. This treaty was concluded on the 2d of September, 1192, and in the following month Richard departed from Syria. The chief result of this Crusade was the possession of Acre, which, until the entire termination of the Crusades, remained the bulwark of the Christians in the East.

The fourth Crusade was set on foot at the instigation of Pope Innocent III., who commissioned Fulk of Neuilly to preach it in 1198. Among its chief promoters was Godfrey of Villehardouin, seneschal of Champagne; Baldwin, count of Flanders; and Hainaut Dandolo, the aged doge of Venice; and the Marquis of Montferrat, who was chosen leader. The Crusaders assembled at Venice in the spring of 1202, but instead of proceeding at once to the Holy Land, they were induced by Dandolo, in spite of the protests of Innocent and the ban of excommunication which he pronounced on them, to attack the town of Zara in Dalmatia—a town which had formerly belonged to the Venetians, but which had renounced its allegiance, and now under the protection of the King of Hungary inflicted considerable loss on the commerce and shipping of Venice. Zara was captured in November; but while the Crusaders were still lying before it messengers had come to them from Constantinople requesting their aid for one of the claimants for the throne of the Byzantine Empire. The Marquis of Montferrat, who through his brothers was connected with the Comneni and with Alexius, who aspired to the rank of emperor, was favourable to the request; and as Dandolo, expecting that considerable advantages might accrue to Venice from the expedition, was not disinclined to it, the Crusade was thus diverted from its original purpose and turned against Constantinople. In 1203 the city was taken, but in consequence of a revolution in the royal palace hostilities between the Crusaders and the Byzantines soon broke out again,

Constantinople was again taken, and on this occasion sacked, and the Crusade ended, without ever reaching its original destination, in the establishment of a Latin empire at Constantinople (1204).

The fifth Crusade was undertaken by Andreas of Hungary in 1217, and was shared in by John of Brienne, to whom the title of King of Jerusalem was given, and by a large number of prelates and nobles. The chief event in this expedition was the invasion of Egypt and the capture of Damietta by the Crusaders, who were soon obliged, however, in consequence of the divisions among themselves, to come to a treaty with the Moslems, and to evacuate the delta of the Nile. Damietta was recaptured by the Sultan Melek el Kamed in 1221, by which the Crusade came to an end.

The sixth Crusade was that of Frederick II., emperor of Germany. It was undertaken at the command of the Pope Honorius III., and was pressed forward by Gregory IX., the successor of Honorius, who died in 1227, before the expedition started. When everything was ready for setting out a pestilence broke out in the army, and Frederick himself was attacked by it, in consequence of which he postponed his departure and retired to the baths of Pozzuoli till he should recover. All the preparations for the expedition were thus frustrated, and Gregory angrily pronounced the ban of excommunication on Frederick for his delay. Frederick, however, without waiting for the ban to be taken off, renewed his preparations in the following year, when he actually started for the Holy Land. Here, without any fighting, by negotiations with the Sultan of Egypt, he recovered for himself, as the heir of John of Brienne, the small Kingdom of Judea, on the condition of tolerating in his kingdom the Mohammedan worship. In spite of the remonstrances of the pope he concluded on behalf of the Christians of the East a truce of ten years (which was soon broken), and got himself crowned at Jerusalem. There was then seen the extraordinary spectacle of the cross being erected on the church of the Holy Sepulchre by the hands of an excommunicated prince overwhelmed with the Papal anathemas. Nevertheless, he returned to Europe in 1229 without having done anything to secure the possession of the territory which he had recovered, and which now once more remained exposed to the ravages of the infidels.

The two last Crusades were led by St. Louis of France (Louis IX.) in person. This prince was resolved to strike a blow at Mohammedanism in Egypt, which country since the foundation of the Ayoubite dynasty had become in some measure the centre of the Moslem faith, or which had at least risen in importance with the decay of Bagdad. Louis embarked at Aigues-Mortes in 1248, and having reached Egypt laid siege to Damietta, which he took in June, 1249. The same year Louis entered on a march up the Nile, which terminated disastrously both for himself and the Crusaders. His army became involved in the numerous bogs and streams about the delta, and being attacked at Mansourah was obliged to retreat. It was overtaken by the army of the sultan in a position in which resistance was hopeless, and the whole army was forced to surrender (1250). Louis recovered his liberty by the surrender of Damietta, and then proceeded with what was left of his army to Palestine, where he repaired the fortresses and anxiously awaited reinforcements. When these did not appear, and when the news was brought to him of the death of his mother, Blanche of Castile, whom he had left regent in his absence, he determined to return home. In the spring of 1254 he embarked at Acre, and landed in France in July, after a stormy voyage.

The second expedition of Louis, forming the eighth and last Crusade, was still more disastrous in its results than the first. He was stirred up to this enterprise by his brother Charles of Anjou, king of the two Sicilies, and partly also induced to undertake it by the chimerical hope of converting the Moorish King of Tunis to Christianity. With this idea he landed his army in 1270 on the northern coast of Africa, where, however, he himself and a large number of his knights died before Tunis. Soon after the king's death a treaty was concluded with the King of Tunis by Charles of Anjou, and the majority of the French Crusaders returned home. A crusading army which had been equipped at the same time under Prince Edward of England (afterwards Edward I.) did not join the army which had set out under Louis until after this peace had been concluded, but rejecting the determination which the French had come to to postpone the further prosecution of the enterprise it continued the voyage to Syria. Edward arrived at Acre in April, 1271, but finding that little was to be effected he in the following year concluded a truce for ten years and returned to England. For nineteen years longer the Christians in Palestine succeeded, but with great difficulty, in holding the remnants of the Latin kingdom there. But Tyre and Berytus were successively snatched from them, and finally the capture of Acre by the Sultan of Egypt in 1291, just 100 years after it had been taken by Richard of England and Philip Augustus of France, extinguished for ever the kingdom founded by the Crusaders.

The results and importance of the Crusades in the world's history are not to be estimated by what they accomplished in Palestine. Their effects upon Europe are felt to the present day, although the object for which the Crusaders strove was a futile one, and remains to this day unaccomplished. By means of these joint enterprises the European nations became more connected with each other, the class of citizens increased in influence, partly because the nobility suffered by extravagant contributions to the Crusades, and partly because a commercial intercourse took place throughout Europe, and greatly augmented the wealth of the cities; the human mind expanded, and a number of arts and sciences, till then unknown in Europe, were introduced there. The present civilization of the European world is, in a great degree, the result of these Crusades. It belongs to a history of poetry to describe how much contemporary poetry was affected by the Crusades, and the extent to which they gave currency to a certain class of ideas that has prevailed ever since. The best history of the Crusades down to the year 1184, and that on which all subsequent histories for that period are principally founded, is the comprehensive work of William of Tyre, written in Latin in twenty-three books, and bearing the title, Belli sacri Historia. It was first printed in 1549, and published at Basel. One of the best authorities on the first Crusade is the history of Albert of Aix. Among the best modern works on the subject are Histoire des Croisades, by De Michaud, a member of the French Academy (fourth edition, Paris, 1825); Charles Mills' History of the Crusades (London, 1820); Heeren's Versuch einer Entwickelung der Folgen der Kreuzzüge für Europa (Göttingen, 1808). There are, besides, incidental narratives relating to the Crusades in Gibbon's Decline and Fall of the Roman Empire, and other works.

CRUSCA, Accademia Della. See Academy.

CRUSTACEA. This sub-kingdom is a branch of the great group of Articulate or Annulose animals, and agrees with the Insects, Arachnids and Myriapods in having the body divided into transverse rings

or *somites*, all of which may and some do possess each a pair of appendages or limbs made up of several pieces jointed or articulated to each other. This character of the limbs separates the group from the Annulate animals (earth-worms, sand-worms, tube-worms, leeches), the limbs of which consist only, when present, of projections of the integument supporting movable bristles. The Crustacea are mostly aquatic, and all, even the terrestrial forms, breathe through the integument, or through the projections of the integument which are known as branchiæ or gills. Locomotion is by the limbs in walking or swimming, or by the limbs together with the flapping of the posterior part of the body, as in the lobster. At no period of life are cilia present. The heart is a longitudinal vessel on the opposite side of the intestinal canal from the nervous system, which consists of a chain of paired ganglia more or less intimately united across the middle line; and the mouth opens between the two first pairs of ganglia, which, with their connecting filaments, surround it with an oval ring. The integument is chitinous (see CHITIN), and remains elastic in some, as the Isopods (Pl. XXXVIII. XXXIX. figs. 22–26), throughout life. But in the majority it is calcified or transformed into a hard shell, prisms of carbonate of lime being deposited in the outer layer. Its expansion being thus arrested, the growth of the animal is permitted by the periodic moults, during which the calcified layer is thrown off, exposing a delicate layer of new integument, in which calcification speedily takes place. This moult or ecdysis is effected by violent and exhausting muscular efforts; in many the moulted shell is entire, but where the limbs are much contracted at the joints, as in the nippers of the lobster, the shell splits along one side so as to facilitate the process. The integument forms the point of attachment for the muscles by which the limbs are moved, whereas in the Vertebrates the hard parts are surrounded by the muscles. Projections of the integument consist of the spines of the lobster, the saw-like crest of the prawn (fig. 17), the strong pointed bristles on various parts of the body, and the peculiar vibrissæ or sensitive bristles of the antennæ. The somites are united in groups constituting the three segments, head, thorax, and abdomen, of which the head is invariably present. The head and thorax may become united into one piece called the cephalo-thorax, as in the crayfish (fig. 16), but on the upper surface an arched line crossing from side to side, and with convexity pointing backwards, marks the line of division between the two parts. The carapace or common shield of this region is formed by the union of several calcified somites, but in others (as fig. 30) the shield is a projection backwards of the calcified integument of a few somites forming a hood over the others. In the Amphipods (fig. 19) all the somites except those of the head are movable; in the crayfish the abdomen is flexible; in the Limulus (fig. 27) the segments move on each other, but the somites are rigid; in the trilobite (fig. 28) the head and abdomen are rigid, the thorax flexible. The lateral projections of the shield descend on either side of the Cypris (fig. 31), and form the two valves of a shell which very closely resembles that of a bivalve mollusc. In the embryonic condition the limbs appear as simple projections of the integument, but as growth advances they become divided into pieces, and modified according to the part of the body on which they occur. Thus the antennæ and the movable stalked eyes of the lobster are modified limbs, and the organs around the mouth are also modified limbs, three of which belong to the head and three belong to the thorax, these latter three resuming in some families their primitive function of locomotive limbs. All these appendages are primarily bifid, the two halves corresponding to the two projections on either side of a ring in a marine worm, or the two bundles of bristle which separately pierce the skin in the earth-worms. But of these two halves, neuropodial and notopodial, according as they are nearer to the neural or inferior surface on the one hand, or to the dorsal on the other, one may disappear or be modified in various ways. The rostrum or spine between the lobster's eyes is obviously a prolongation of the carapace, but it is not certain whether the end of the abdomen is to be regarded as equivalent to the rostrum, or really as the representative of a somite. Excluding it, the somites of a lobster are twenty in number, and they are thus allocated:—*Head*—eyes, antennæ, antennules, mandibles, first pair of maxillæ, second pair of maxillæ. *Thorax*—first, second, third pairs of jaw-feet (maxillipeds), chelæ or great nippers, two pairs of smaller nippers, two pairs of legs ending in sharp points. *Abdomen*—five pairs of natatory limbs; sixth pair expanded oarlike, forming, with the flattened terminal plate or *telson*, a broad paddle, similar in position and action to the tail-fin of a whale. The names of these segments are borrowed from human anatomy, but though the succession of parts is similar, their functions are not identical. Thus the contents of the head are the first two pairs of ganglia, the sense organs, the stomach, liver, and reproductive organs, the heart, and, externally, the gills; the intestine traverses the abdomen, and opens on the under surface of the telson. The mandibles are two massive calcareous plates with denticulate margins, the maxillæ are similar but less powerful, and these three pairs of cutting instruments work from side to side, while the jaws of vertebrates meet in a line which is transverse to the axis of the body. The stomach is remarkable as a piece of machinery. A framework of calcareous rods is so jointed together that its movements assist in triturating the particles introduced from the mouth. The liver is in two symmetrical portions which open by ducts on either side of the intestine. The tubular heart communicates by valvular openings on either side with the so called pericardial sinus, receiving thence the venous blood. The blood is not conducted in vessels, but escapes from the open ends of the tubular propulsive organ, and wanders through the interstices of the tissues, returning to the pericardium. The reproductive organs open in both sexes at the base of one pair of thoracic limbs. The nervous system has already been stated to consist of successive pairs of ganglia connected by commissural cords into a chain. This chain is protected in the thorax by structures which recal the spinal canal of Vertebrates. From the neural or inferior somites, and from the chitinous integument which connects them and makes them movable on each other, calcareous processes project inwards in symmetrical pairs and meet in the middle line, forming a kind of basket-work arching over the ganglionic chain, but this structure is derived entirely from the integument, and has only an analogy in function to the vertebrate skeleton. The organs of special sense consist of the compound eyes, each facette containing a portion of the ophthalmic nerve, a dark chamber, and a corneal face; of the auditory capsules situated at the base of the antennæ, and containing the otoliths (small masses of lime or of silica, whose vibrations, corresponding to those of the air or water, transmit to the nerves with which they are in contact the sensation of sound); and of the antennæ and antennules, which are very delicate tactile organs, though they are scarcely superior to the tips of the legs, which are undoubtedly employed as organs of touch. The ganglia in front of and behind the mouth, the supra- and infra-œsophageal ganglia, have no func-

tion comparable to that of the brain; they and the other ganglia are probably the representatives of the sympathetic system of Vertebrates (see NERVOUS SYSTEM).

The development of the lobster commences by the formation of the embryo from a part of the contents of the egg. The rudiments of the embryo are first formed on the neural side as in the vertebrates, but whereas in the latter that side is turned away from the ground in progression, and in the former is turned towards it, the completion of the embryonic body, though advancing, in both cases, from the neural to the hæmal side (that is, from the side on which the nervous system is placed to that on which the heart lies), does so in opposite directions. The neural surface bends upwards anteriorly, and the two sides of the body cover it over, just as if, in place of closing an envelope in the ordinary way, one were to thrust the tongue of the envelope *inside* the two side pieces; and the remains of the anterior end of the neural surface are to be found inside the head, if the rostrum and a bit of the shell behind it are carefully removed. The eyes, therefore, which appear to belong to the upper surface of the head, in reality belong to the lower. The Trilobite shows a line passing from before backwards on either side of the head, and the eyes are outside of this line. The curvature by which a part of the lower comes to form part of the upper surface is of great antiquity, and is found in the insects, as in the house-fly and the cockroach. The first stage of the lobster embryo is that of *Nauplius*, a minute object with three pairs of limbs; the second is the *Zoëa* stage when the cephalo-thorax is provided with an anterior and a posterior spine in the middle line, and two lateral spines, the flexible abdomen projecting backwards between them. By successive moultings the adult form is attained, but the process is one of true metamorphosis, since not only does the form change, but the functions of the organs likewise, for what were the locomotive organs of the Nauplius become the antennae, antennules, and mandibles of the adult. The successive stages of this metamorphosis are of grand importance in the classification of Crustacea, since they may be grouped according as they present greater or less resemblance to one or other of these stages, and such a classification means, to the evolutionist, a chronological history, the relative dates of the origin of each order being indicated by the greater or less resemblance which it bears to the primitive or Nauplius form. This method of classification is of great value whether the evolution theory is or is not adopted, since it affords a convenient arrangement of forms according to their anatomical resemblances. The Crustacea may be arranged in the following order:—

I. Those which retain more of the Nauplius form.

Order 1. Ostracoda: *e.g.* Cypris, fig. 31. Order 2. Pectostraca: *e.g.* the Barnacles. Order 3. Copepoda: *e.g.* Cyclops, fig. 32; and the suctorial parasites of fishes. Order 4. Pœcilopoda: *e.g.* Daphnia (water-flea), fig. 30; Apus, fig. 29; Trilobite, fig. 28. Order 5. Merostomata: *e.g.* Limulus, fig. 27; and the extinct Pterygotus and Eurypterus.

II. Those which show more of the Zoëa type.

A. Podophthalmata.—Order 6. Decapoda; *a*, Macrura: the Lobster, fig. 15; Crayfish, fig. 16; Prawn, fig. 17; *b*, Anomura, the Hermit Crab; *c*, Brachyura: *e.g.* the Land Crab, fig. 8; Frog Crab, fig. 9; Spider Crab, fig. 10; Woolly Crab, fig. 11; Purse Crab, fig. 12; Albunea, fig. 13. Order 7. Schizopoda; the Opossum Shrimp. Order 8. Stomatopoda: *e.g.* the Squill, fig. 18.

B. Edriophthalmata. Order 9. Isopoda: *e.g.* figs. 22, 23, 24, 25, 26. Order 10. Amphipoda: *e.g.* Caprella, fig. 21; Screws, figs. 19, 20.

Such is a general view of the classification now adopted by most writers, and referred to in essays on evolution. Detailed information regarding most of the orders will be found under the separate headings, but a general statement of their relations may not be out of place here. The figs. 30 and 32 resemble curiously the Nauplius of the crabs, and their maturity shows no form comparable to that of the higher crustaceans. The young barnacle is a Nauplius form which soon becomes attached by its head, and the limbs become the glass hand which sweeps in and out of the complicated shell. A family of this order undergoes a still more extraordinary change: its members are found parasitic on hermit-crabs, and in their sexually mature state they are reduced by the disappearance of limbs to sausage-like sacs full of ova. This is known as retrograde metamorphosis: it is an adaptive change, the animal retaining only those structures which are needed to secure the propagation of the species. All of the division A (except, perhaps, Eurypterus and Pterygotus, of whose life-history we know nothing) undergo metamorphosis; and in the Trilobites the changes seem to have been very numerous, several genera and species having been found to be only stages of one species. The Podophthalmata, or Stalk-eyed Crustaceans, including those in which the thoracic feet are apparently five pairs (hence their name Decapods, that is ten-footed), the first three pairs being modified to subserve mastication; the Schizopoda and the Stomapoda do not all pass through metamorphoses, or, to speak more correctly, the changes take place in some in a very short time, even before they have escaped from the egg, but traces of the changes are still recognizable. Thus the Isopods, which escape from the egg in the same form as the adult, have, just before being hatched, a slight protuberance on the dorsal region just over the heart, corresponding to the position of the spine, which in most Zoëæ projects in that locality; and the embryo possessing this rudimentary appendage has undergone its later growth within a membrane to which there is no counterpart in ordinary development within the egg: it is in fact a Nauplius skin, and there is, so to speak, a moult within the egg. There is therefore not merely general agreement in the plan of the body among Crustacea, but a still more remarkable agreement in the details of development, according to which they may be grouped. Certain interesting parallels are to be noticed among the Articulata. The Podophthalmata are divided into Macrura, in which, as the Lobster, the abdomen is long and flexible; the Anomura, or hermit-crabs, in which the abdomen is peculiarly developed, its terminal appendages being the organs by which it adheres to the shell it has taken possession of; and the Brachyura, or common crabs, whose tail is tucked under the body, and only forms a kind of cover for the eggs crowded beneath it during this development. The spiders and scorpions are parallel among the Arachnida; and even among the Crustacea themselves the Amphipoda (fig. 20), Læmodipoda (fig. 21), and Isopoda (fig. 23) present a similar gradation. The distribution of the Crustacea in time is interesting. In the Palæozoic rocks the Phyllopod group of the Pœcilopoda is represented by Hymenocaris and others, closely related to Apus. But the great mass of Palæozoic Crustacea belong to the Merostomata. The Ostracoda are abundant from the Silurians down to the present; and in the Carboniferous period contributed importantly to the commercial value of the oil-shales. The Cirripeds have left remains in the Silurians. The Isopods first appear in the Devonian rocks. The Stomapoda are found in the Carboniferous, the Amphipoda in the Permian, and, doubtfully, in the Silurian. The Ma-

crurous Decapods are represented by a prawn-like animal in the Coal series; the Brachyurous do not appear till the Lower Oolites. Of the ten orders enumerated above the Merostomata alone are extinct, and their life closed with the Carboniferous period. Of the remaining nine all are represented during Palæozoic times. If, therefore, these orders represent successive divergences from a common stock, the divergence must have been rapid in that early period, or the common ancestry must have dated from long prior to our earliest fossiliferous record; and of the two hypotheses the latter is the more probable.

CRUZ, Santa, or Saint Croix, the largest and most southern of the Virgin Islands, West Indies, forming, with St. Thomas and St. John, the Danish government of West Indies. It lies 65 miles E.S.E. Porto Rico, and is about 20 miles long from E. to W., by about 5 miles broad; area, 110 square miles. It is generally flat—though a range of low heights follows the line of its north shore—well watered and fertile; climate at times unhealthy, and temperature varying from 54° to 72°. Earthquakes and hurricanes are frequent. Two-fifths of the island are in sugar-cane plantations, and about one-half is occupied with general crops, only a small portion remaining uncultivated. Some cattle are reared. The capital and residence of the governor is Christianstadt; and in the island is another small town called Frederikstadt. Santa Cruz was discovered by Columbus on his second voyage; and was, by turns, under the sway of the Dutch, British, Spaniards, and French, who ceded it to Denmark. It was taken by the British in 1807, and restored to the Danes by the Treaty of Paris. The prevailing language is English. Pop. 25,600.

CRUZ (Santa) DE LA SIERRA.—1. A department of Bolivia, bounded N. by rivers Beni, Mamore, Itenez, and the Brazilian province Matto-Grosso; E. by the river Paraguay and the Brazilian territory; S. by the Pilcomayo and the desert of Gran Chaco; W. by the departments Cochabamba and Chuquisaca. It lies between the parallels 15° and 21° S., and the meridians 58° and 63° W., and contains the provinces of Santa Cruz, Valle Grande, Cordillera, and Chiquitos. It has an area of 144,000 square miles, mostly level, but reaching the Andes on the W., and includes the Chiquitos Mountains. Pop. about 190,000. —2. A town, Bolivia, capital of above province and department, on the right bank of the Piray, lat. 17° 24′ S.; lon. 62° 20′ W.; stands in the midst of forest; the houses are mostly one story high, built with timber and earth, with large balconies and uneven roofs. Owing to the absence of men at distant cattle stations, two-thirds of the population, which is about 10,000, consists of women.

CRUZ (Santa)-DE-MUDELA, a town, Spain, New Castile, province of, and 26 miles S.E. Ciudad-Real, on the E. declivity of Mount St. Roque. The houses in general are tolerably well built, the streets clean and paved. There is a large square containing the meat market and town-house—the latter adorned with a handsome portico. The male portion of the inhabitants are principally occupied in husbandry, and the females in weaving. A small trade is prosecuted in cattle, grain, wine, oil, fruits, salt fish, &c. Pop. 4950.

CRUZ (Santa) DE TENERIFFE, the capital city and chief commercial port of the Canary Islands, on the north-east coast of the island of Teneriffe. Many of the houses are handsome, and of one and two stories high; but the majority are low. However, as they are white-washed or painted, they present a gay appearance, and give evidence of the neatness and cleanliness of those who inhabit them. The streets are well paved, and provided with footpaths and lamps; and there is a square, surrounded with good edifices, adorned with a colossal statuary group representing the apparition of the Virgin of Candelaria to the Guanches, the original inhabitants, and having at the extremity facing the sea the principal fort, that of San Cristobal. Besides the custom-house and the military hospital, there are scarcely any public buildings, such as usually characterize a capital; and almost all the public bodies hold their meetings in the old Franciscan convent. The harbour, which is very secure, and can easily contain ten or twelve vessels of war, has a magnificent mole, of modern construction, which juts out far into the sea, and the coast is commanded by four forts and various redoubts. Wine, brandy, almonds, and cochineal are the chief articles exported; and the imports consist of English, French, Spanish, and German manufactures. Pop. 12,000.

CRUZADO, a Portuguese money of account. The old cruzado or cruzado-velho is worth 400 reis, or 1*s.* 9½*d.*; the new cruzado, cruzado-novo or pinto, is worth 480 reis, or 2*s.* 1⅔*d.* There was formerly a coin called a cruzado. The last was struck in 1822.

CRYOLITE, or Kryolite ($Al_2F_6,6NaF$), a double fluoride of aluminium and sodium, is a mineral of considerable interest. Last century round water-worn lumps of it, used by the Greenlanders for sinking their fishing-lines, were sent to Copenhagen as curiosities by the missionaries. The substance itself was examined by Peter Chr. Abildgaard, secretary of the Danish Academy of Sciences, who published a paper on it in 1800, in which he determined its composition, and gave it the name of *cryolite*, or ice-stone (from the Greek *cryos* or *kruos*, frost), because it melts readily even in the flame of a candle, and an analysis of it was also made by Klaproth. In 1806 Sir Charles Giesecke, who was travelling in Greenland, influenced by a native, went in search of some lead-ore in a firth called Arksut, access to which is difficult on account of ice. He sailed up this firth for 16 miles, but could find no lead, until at a place called Iviktœt (usually in English books, *Evigtok*), which the natives used to frequent for fishing and drying salmon, he perceived a white spot, which he first thought was ice, but on landing and examining it, he ascertained it to be a bed of cryolite, which had never before been found in situ. It lies upon gneiss, and is covered by the tide at high-water. Other minerals accompany it, in particular, tinstone, arsenical pyrites, quartz, and fluor-spar. The cryolite is in some places white and decomposed, but passes into grayish-white. There is besides another bed which passes from white and gray to pink, yellow, and brown. This variety contains felspar, quartz, sparry iron-ore, galena, and many other minerals imbedded in it as in a matrix, and its existence was first made known by Giesecke. After his return to Europe the mineral became of great value to collectors, and it was looked upon as one of the greatest rarities possible. This continued until 1855, when H. Rose proposed it as a material for the direct preparation of aluminium by means of sodium, instead of the double chloride of aluminium and sodium usually employed. It was tried and succeeded, only the aluminium produced was not of sufficient purity, so that the previous method was still retained, though cryolite was used as a flux. Rose further found that if the cryolite be boiled with slaked lime, aluminate of soda is the result, which yields a soap with fats, and this operation promised so well that the manufacture of soda and of alumina from cryolite was begun, first by a company at Copenhagen, and afterwards at Marburg and at Saaran, in Silesia. The cryolite is carefully selected for the purpose, the whitest parts are taken, and all mineral matters are picked out, then it is ground fine and in-

timately mixed with finely-ground chalk, as free as possible from iron. The mixture, consisting of 100 parts cryolite and 125 or more parts of chalk, is roasted in a reverberatory furnace, heated with coke, by which aluminate of soda is formed, with calcic fluoride and carbonic anhydride. The mixture is lixiviated, freed from the insoluble fluoride, and the alkaline solution treated with the carbonic anhydride from a previous calcination. Alumina is precipitated, and carbonate of sodium crystallized from the solution. The alumina is afterwards dissolved in sulphuric acid and crystallized. Both products are singularly pure; the soda is free from the usual impurities of soda by Leblanc's process, and the aluminic sulphate contains no iron, a great advantage when the alumina is used as a mordant.

An attempt was made to obtain the sulphate direct by decomposing the cryolite with sulphuric acid, but the quantity of acid required, and of hydrofluoric acid evolved, and the necessity of converting the sodic sulphate into carbonate by a separate process, was found not to be commercially successful. A plan, however, has been devised of getting an alumina mordant direct from it. The mineral is boiled with slaked lime, the clear liquor run off and exactly neutralized with pyroligneous acid. The insoluble matter is allowed to settle, the fluid is evaporated to crystallize the acetate of sodium, and the liquid is mixed with pyroligneous and sulphuric acid in certain proportion and shaken, when a salt consisting of sodic and aluminic sulphates and aluminic acetate is formed. The substance is colourless, free from iron, gelatinizes on heating, and turns liquid when cold, and can be used at once in printing.

Another use to which cryolite has been put in America is the manufacture of a hard porcellanous glass of great beauty, containing 67–70 silica, 10–11 alumina, 19–20 soda. In the process of fusion, silicic fluoride is copiously evolved, which is condensed into hydrofluo-silicic acid, used in making caustic potash from Stassfurt salts, and silica, used in making silicate of soda.

The most recent account of the cryolite mine is given by Dr. Isaac J. Hayes, who visited it in 1869 (Land of Desolation; London, 1871, pp. 184–187). He says—'This great kryolite mine is managed after a most inconvenient fashion. In the first place, it is a monopoly of the Danish crown, which has leased it to a Danish company for a period of years, to work upon a royalty of twenty per cent. This Danish company have sold to the Pennsylvania Salt Company the exclusive right in America to the disposal of the ore, if such it may be for convenience called, to the extent of one-half the production of the mine. This Pennsylvania Salt Company having no means of transportation of its own, lets out that part of its business to a company in Boston. . . . The soda is the product which makes the mine (or rather quarry) valuable. And a mine of riches it would be, truly, were it anywhere else almost in the whole wide world. Its great distance from manufacturing marts; the extraordinary dangers attending the shipment of it, owing to the ice; the high royalty which the government imposes; and the shortness of the season during which the miners can work, make it comparatively of little importance in a commercial point of view. Yet one-half the product of the mine (6000 tons) is annually shipped to Philadelphia, in from fifteen to twenty vessels, whence it is carried by rail to Pittsburg, to be converted into commercial soda by the Pennsylvania Salt Company, who would, but for the mine at Iviktut, be compelled to make their soda from artificial sources.

'The discovery of the mineral was made by the natives many years ago. It is said they used it in a powdered state, as civilized men do snuff.[1] At first it showed itself as a little round, yellowish hummock above the general gray of the metamorphic rock which inclosed it. Upon coming to the knowledge of the world, only a few fragments were brought away; and I can remember the time when my mineralogical studies first commenced, that to obtain the smallest fragment even of the Greenland kryolite, was to add to a collection one of its most rare and costly minerals. Now it has no other value than to boil down into soda for ordinary commercial uses.

'The mine has been in operation under the present company about twelve years. An effort to work it had been previously made, but failed for want of capital, and under the present management it has only lately been profitable. The mineral appears to exist as a sort of conical injection through the overlying rock. It is now worked down until the mine, or quarry, is about 60 yards in diameter, and 50 feet deep, 40 of which are below the sea-level; and since the solid rock is interrupted for a short distance on the sea-side, the water has constantly endangered the mine by flooding—a catastrophe only prevented by the admirable engineering skill of the company's superintendent.

'The number of miners employed is about 100. . . . The kryolite is the only mineral product of Greenland that has proved of any commercial value.'

Cryolite, then, occurs massive with a lamellar structure. Hayes says that he got from the superintendent the gift of the only fine specimens of cryolite crystals he ever saw. The crystalline form, however, is at present undetermined. It has a vitreous lustre, translucent, but transparent in water. Brittle and soft. Sp. gr. 2·96. According to different analyses it contains 54–60 fluorine, 12·8–13 aluminium, 26·8–32·9 sodium. It is readily fusible, and is slightly soluble in water. The deposit at Evigtok is 80 feet thick and 300 feet long. Cryolite has also been discovered at Miask, in the Ural, associated with fluorspar, lithium mica, and chiolite, which is similar in composition to cryolite.

CRYOPHORUS, an instrument for showing the diminution of temperature in water by its own evaporation. Wollaston's cryophorus consists of two glass globes united by a moderately-wide glass tube. Water is poured in and boiled to expel the air, and while boiling the apparatus is hermetically sealed. When it is to be used, the water is made run into one of the globes, and the other is buried in a freezing-mixture. The aqueous vapour in the globe being thus condensed, a vacuum is produced, fresh vapour rises from the water in the other globe, which is again condensed, and this proceeds continuously till the water remaining in the globe has been, by the evaporation, cooled to the freezing-point.

CRYPT, in architecture, a hollow place or vault constructed under ground. The tombs of the Christian martyrs also were so called, where the early Christians met to perform their devotions, for fear of persecution. Hence crypt came to signify a church under ground, or the lower story, like that of St. Paul's, London, Lastingham Priory, and many of the ancient ecclesiastical edifices of Britain, Germany, and France. When crypts are on a large scale, like those of Rome, Naples, and Paris, they are then called *catacombs*. (See CATACOMBS.) Bartoli and Bellori have published engravings of paintings found in the crypts of Rome, of which there are several editions. The one of 1738 is in Latin.

[1] [A different account from this, however, is given by some writers. The Greenlanders use two blocks of cryolite for grinding the tobacco-leaf, and the snuff so made, which contains a quantity of cryolite powder, is what they prefer to all other kinds.]

CRYPTIDINE ($C_{11}H_{11}N$), a base, homologous with chinoline, obtained in the preparation of that body, and found also in the less volatile parts of coal-tar. Its boiling-point is not less than 525° F., but it has not yet been prepared perfectly free from its lower homologues. It forms a double salt with platinum.

CRYPTO, a prefix from the Greek *cryptos* (secret), used in several compounds; for instance, *cryptography, cryptogamia.*

CRYPTOGAMIA, in botany, the division embracing the lower classes of plants having no evident flowers, or in which the reproductive organs are obscure. They are propagated by spores. Ferns, lycopodiums, horse-tails, mosses, pepperworts, lichens, fungi, charas, and sea-weeds all belong to this division of the vegetable kingdom.

CRYPTOGRAPHY (from the Greek *kruptos* or *cryptos*, secret, and *graphein*, to write), the art of transmitting secret information by means of writing, which is intended to be illegible except by the person for whom it is destined. The ancients sometimes shaved the head of a slave, and wrote upon the skin with some indelible colouring matter, and then sent him, after his hair had grown again, to the place of his destination. This is not, however, properly secret writing, but only a concealment of writing. Another sort, which corresponds better with the name, is the following, used by the ancients. They took a small stick, and wound around it bark or papyrus, upon which they wrote. The bark was then unrolled and sent to the correspondent, who was furnished with a stick of the same size. He wound the bark again round this, and thus was enabled to read what had been written. This mode of concealment is evidently very imperfect. Among the methods which Ovid teaches young women, in order to deceive their guardians when they write to their lovers, he mentions that of writing with new milk, and of making the writing legible by means of coal-dust or soot. Ausonius proposes the same means to Paulinus. It is now well known that several metallic solutions may be employed for this purpose; and that these, on being exposed to the action of certain vapours, become visible, and thus exhibit the characters which had been written with them.

Cryptography properly consists in writing with signs, which are legible only to him for whom the writing is intended, or who has a key or explanation of the signs. The most simple method is to choose for every letter of the alphabet some sign, or only another letter. But this sort of cryptography (*chiffre*) is also easy to be deciphered without a key. Hence many illusions are used. No separation is made between the words, or signs of no meaning are inserted among those of real meaning. Various keys likewise are used, according to rules before agreed upon. By this means the deciphering of the writing becomes difficult for a third person not initiated; but it is likewise extremely troublesome for the correspondents themselves; and a slight mistake often makes it illegible, even by them. Another mode of communicating intelligence secretly, viz. to agree upon some printed book, and mark the words out, is also troublesome, and not at all safe. The method of concealing the words which are to convey the information intended in matter of a very different character, in a long letter, which the correspondent is enabled to read by applying a paper to it with holes corresponding to the places of the significant words, is attended with many disadvantages: the paper may be lost; the repetition of certain words may lead to discovery; and the difficulty of connecting the important with the unimportant matter, so as to give the whole the appearance of an ordinary letter, is considerable. If this is effected, however, this mode has the advantage of concealing the fact that any secrecy is intended. Writing with sympathetic ink, or milk, lemon-juice, &c., is unsafe, because the agents to make the letters visible are too generally known. Hence the *chiffre quarré*, or *chiffre indéchiffrable*, so called, has come very much into use, because it is easily applied, difficult to be deciphered, and the key may be preserved in the memory merely, and easily changed. It consists of a table in which the letters of the alphabet, or any other signs agreed upon, are arranged under one another, thus:

z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a
b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b
c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c
d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d
e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e
f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f
g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g
h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h
i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i
k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k
l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l
m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m
n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n
o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o
p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p
q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r
s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s
t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u
v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v
w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w
x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x
y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y
z	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z

Any word is now taken for a key; *Paris*, for example. This is a short word, and, for the sake of secrecy, it would be well to choose for the key some one or more words less striking. Suppose we wish to write in this cipher, with this key, the phrase 'We lost a battle;' we must write *Paris* over the phrase, repeating it as often as is necessary, thus:—

P a r i s P a r i s P a r
W e l o s t a b a t t l e.

We now take, as a cipher for *w*, the letter which we find in the square opposite *w* in the left marginal column, and under *p* on the top, which is *m*. Instead of *e* we take the letter opposite *e* and under *a*, which is *f;* for *l*, the letter opposite *l* and under *r*, and so on. Proceeding thus, we should obtain the following series of letters:—

mfcxlibtkmimw.

The person who receives the epistle writes the key over the letters; as,

P a r i s P a r i s P a r
m f c x l i b t k m i m w

He now goes down in the perpendicular line, at the top of which is *p*, until he meets *m*, opposite to which, in the left marginal column, he finds *w*. Next, going in the line of *a* down to *f*, he finds on the left *e*. In the same way, *r* gives *l*, *i* gives *o*, and so on. Or you may reverse the process; begin with *p*, in the left marginal column, and look along horizontally till you find *m*, over which, in the top line, you will find *w*. It is easily seen that the same letter is not always designated by the same cipher; thus, *e* and *a* occur twice in the phrase selected, and they are designated respectively by the ciphers *f* and *w*, *b* and *k*. The key may be changed from time to time, and a different key may be used with each correspondent. The utmost accuracy is necessary, because one character, accidentally omitted, changes the whole

cipher. The correspondent, however, may ascertain this with considerable trouble. See DECIPHERING.

CRYPTOLINE AND BREWSTOLINE, two organic fluids found by Sir David Brewster in cavities in topaz, amethyst and quartz. Cryptoline, when exposed to the air, changed to a yellow transparent resin, insoluble in water and in alcohol, but soluble in strong acids. Brewstoline evaporated rapidly in the air, except some minute solid particles, which also disappeared on heating. Sir David Brewster discovered that cavities containing fluids also exist in diamonds.

CRYPTOLITE ($Ce_2 2PO_4$), one of the minerals containing the rare element cerium. It was separated by Wöhler from its matrix, a green and red apatite found at Arendal, in Norway, by dissolving the apatite in dilute nitric acid, when the cryptolite remained in minute hexagonal needles of a wine-yellow colour, but mixed with other substances.

CRYPTOPINE, or CRYPTOPIANINE ($C_{25}H_{26}NO_5$), is extracted by a complex process from the alcoholic fluids remaining from the preparation of crude morphia. It is present in opium, in so small a quantity, that about an ounce of the hydrochloride is obtained from a ton of opium. It crystallizes in six-sided tables and prisms, dissolves in alcohol and chloroform, but is insoluble in water. It is a powerful base and saturates the strong acids, forming both neutral and acid salts. They dissolve in water, and have a bitter taste.

CRYSTAL, in chemistry and mineralogy, any body which, by the mutual attraction of its particles, has assumed the form of some one of the regular geometric solids, being bounded by a certain number of plane surfaces. The chemist procures crystals either by fusing the bodies by heat, and then allowing them gradually to cool, or by dissolving them in a fluid, and then abstracting the fluid by slow evaporation.

The method of describing and classifying crystals now universally adopted is based upon certain imaginary lines drawn through the crystal, and called its *axes*. The classes are as follow:—1st, The *regular* or *cubic* system, in which the axes are equal and at right angles to one another; 2d, The *square prismatic* or *dimetric* system, in which the axes are at right angles to each other, and while two are equal, the third is longer or shorter; 3d, The *right prismatic, rhombic*, or *trimetric* system, in which the axes are at right angles to each other, but all are of different lengths; 4th, The *hexagonal* or *rhombohedral* system, which has four axes, three in one plane inclined to each other at 60°, the fourth perpendicular to this plane; 5th, The *monoclinic* or *oblique* system, in which two axes are at right angles, and the third is inclined to their plane; 6th, The *triclinic*, or *doubly oblique*, in which the three axes are inclined to each other at any angle other than a right angle. In the 5th and 6th systems the axes may be of any length.

A crystal consists of three parts. 1st, Plane surfaces, called the faces of the crystal, which are disposed symmetrically about the axes. A cube, for example, has six faces, each of which is at the same distance from the point of intersection of the axes, or centre of the crystal. The faces are said to be similar, which are equal to one another, and similarly situated; dissimilar when they are unequal, or have a different position. 2d, Edges, formed by the meeting of two faces. They are said to be similar when formed by similar faces; dissimilar by dissimilar faces. Equal edges are formed when the faces are inclined at the same angle to one another, unequal when they are inclined at different angles. 3d, Solid angles, formed by the meeting of three or more faces; and in this case also there are similar and dissimilar, equal and unequal solid angles, according as they are formed by similar or dissimilar faces, and equal or unequal angled edges.

In some cases all the parts of a crystal appear in their simplest form, for example in rock-salt, or iron pyrites, or alum, and when all the faces are exhibited the crystal is said to be holohedral. But quite as frequently the primitive form is modified, so that half of the faces disappear, and then the crystal is said to be hemihedral, or a number of new faces are developed which bear a certain relation to the original faces. The principal modifications are the following:—1st, *Truncation*, when the edge is replaced by a surface, which may be either parallel to it or placed obliquely; 2d, *Bevelment*, when the edge is replaced by two planes placed parallel to it; 3d, *Acumination*, when the solid angle is replaced by another more obtuse solid angle with the same or a different number of sides. Sometimes the secondary faces become dominant, and the primary faces subordinate. As the crystals of a substance existing naturally or formed artificially may be of very variable dimensions, some of the parts of a crystal must also vary. These are the faces, which may be large or small, and the edges, which may be long or short. But the edge angles and the solid angles continue unchanged to whatever dimensions the crystal may grow. Hence the importance of the measurement of the last-mentioned element of a crystal.

The nature of crystals has, from its great importance, been a subject of investigation to many eminent men; but more particularly to Bergman and Haüy, Weiss and Brooke. This last philosopher, from an observation of the well-known fact that crystals can be divided only in certain directions, so that the fracture may have a smooth surface, deduced an ingenious and useful theory of the forms of these bodies. This theory being founded on abstruse mathematical principles, we cannot here enter into its minute details; but we shall lay down the leading results. The carbonate of calcium is founded in crystals of six sides or hexahedrons. Now if we take one of these crystals and endeavour to divide it parallel to the edges by introducing a sharp knife at the base, we shall find that only three will divide at each end, the three at the one base being alternate to the three at the other. There will then remain a solid, bounded by six trapeziums, each having a lustre which shows that it is one of the natural joints of the crystal. Continuing the divisions parallel to the first sections, it will be found that the bases will continually diminish until they disappear altogether, and also that the altitudes of the lateral sides diminish until we arrive at a twelve-sided solid (dodecahedron) bounded by pentagons; but by continuing the sections, we arrive at faces of a triangular form, and continuing still farther, we arrive at an obtuse rhomboid, which is called the nucleus or primitive form of the crystal. The nucleus of one crystal may, and often does, differ from that of another in form, but the nucleus of the same crystallized substance is always the same. The nucleus or primitive form of carbonate of calcium is an obtuse rhomboid; all the other forms which preceded it in the division are called secondary. This mechanical division may, however, be carried still farther by separations parallel to the bounding surfaces, and sometimes division is practicable in other directions until we arrive at last at the *integrant molecule*, which is no longer divisible excepting by the action of chemical agents. The form of the integrant molecule of a crystal is always one of these three—the tetrahedron, the triangular prism, or the parallelopiped, these figures being the simplest class to which they belong. The integrant molecules or particles of crystals have been supposed by Dr. Wollaston to be composed of spherical atoms, which

formed differently-shaped molecules, according to their number. Three would form a triangular pyramid, four a cube, and with two added, one at each end, an acute rhomboid, &c.; which figures may be imitated with leaden bullets. These atoms being attracted form the particles that cohere from the nucleus, which again is surrounded by laminæ, formed by the particles, and these laminæ decrease in magnitude by the subtraction of molecules, as they advance from the nucleus to the surface of the crystal. The angles of crystals are measured by an instrument called the goniometer (which see).

CRYSTALLOID. See COLLOID and DIFFUSION.

CRYSTAL PALACE. See LONDON.

CSOMA DE KÖRÖS, ALEXANDER (*Körösi Csoma Sandor*), a Hungarian scholar, born at Körös about 1790, educated gratuitously at the College of Nagy-Enyed. The curiosity common among the Magyars to trace the country in Asia from which their ancestors came inspired him from an early age with a determination to travel in the East. In 1815 he went to Göttingen to study medicine, and acquire a knowledge of oriental languages. In 1820 he set out on his travels, with a trifling provision supplied by one of his friends. He crossed the Balkan, visited Constantinople, embarked for Alexandria, and traversing Egypt and Syria, arrived at Teheran within the year of his setting out. In this region he expected to find a nation speaking a language akin to the Hungarian, and to return with the object of his search accomplished within another year. His enthusiasm, however, carried him further than he had anticipated. At Teheran he was struck with an apparent resemblance between the Tibetan and the Magyar languages, and resolved to master the former. Partly in company with the English traveller Moorcroft, and partly alone, he wandered across Little Bokhara, traversed many of the Himalayan valleys, and at length reached Tibet. Here, in the Buddhist monastery of Kanam, in the Himalaya Mountains, on the borders of Tibet and India, he spent four years (1827 to 1830) studying Tibetan, of which he had written down 40,000 words when he left for Calcutta. During four months he never moved from a room 9 feet square, where he remained without a fire, with the temperature below zero of Fahrenheit, studying the Buddhist sacred books from morning to night. On reaching Calcutta a great disappointment awaited him, the bitterness of which threw him into an illness. Further research had not borne out the resemblance he had imagined between Tibetan and the Magyar language, but he had pursued his studies in the belief that he had found an original treasure, valuable for historical purposes, in the language and literature of Tibet itself. He now found that the Tibetan literature consisted only of translations from the Sanskrit, which he might have learned at home. On recovering from this disappointment he found that there were other uses for his learning. The library of the Asiatic Society contained 1100 volumes in Tibetan, which no one had been able to catalogue. This task he undertook and executed satisfactorily. His investigations into the Buddhist religion also proved valuable to scholars who had already been engaged in the study of it. He was also employed by government to prepare a Tibetan grammar and dictionary. The Transylvanian diet at this time voted him £140, which he devoted to the purchase of Indian books and MSS. He remained in Calcutta for some years, studying Sanskrit and other eastern languages, and still believing that his original object was to be accomplished. He then set out for Lassa, the capital of Eastern Tibet, between which and the western confines of China he expected to find the original home of the Magyars. He died while on this journey, at Darjeeling, a sanatory station for British troops in the Sikkim territory, 318 miles north of Calcutta, 11th April, 1842. Csoma's Dictionary of the Tibetan Language (Calcutta, 1834) was the first standard work on the subject, and to it all subsequent scholars in the language have been indebted. He also wrote numerous articles on Tibetan literature in the Journal of the Asiatic Society of Bengal, and an Analysis of the Kat Gyur, the principal sacred book of the Buddhist religion, which is printed in the twentieth volume of Asiatic Researches.

CSONGRAD, a market town, Hungary, circle Hither Theiss, capital of a county of the same name, at the junction of the Körös with the Theiss, 72 miles S.E. of Pesth. It is a very poor place, but is surrounded by meadows and vineyards. The surrounding country is very flat, but has excellent pastures. Pop. 17,356.

CTENOPHORA, an order of marine animals belonging to the sub-kingdom Cœlenterata, class Actinozoa, and defined by Greene as 'transparent, oceanic, gelatinous Actinozoa, swimming by means of *ctenophores*, or parallel rows of cilia disposed in comb-like plates. No corallum.' *Pleurobrachia* (or *Cydippe*) may be taken as the type of the order, which also includes the Beroidæ, the Cestum, or Venus' girdle, &c.

CTESIAS, a Greek historian of eminence, whose writings are particularly valued for the light they throw on the history of eastern nations. The date of his birth and death are not known; but he was contemporary with Xenophon and partly with Herodotus. He was a physician, and lived for a number of years (seventeen) at the court of Persia, where, as Diodorus states, he was first brought as a prisoner. Diodorus and Tzetzes say he returned to Cnidus B.C. 398. He wrote his History of Persia with the view of correcting the errors prevalent among his countrymen about that country. According to Diodorus his work is derived from the official history of the Persians, written according to the law of the country. This work was written in the Ionic dialect, and contained twenty-three books. The first six contained the history of the Assyrian Empire down to the foundation of the Kingdom of Persia. It differs, particularly in regard to dates, from Berosus, the Babylonian historian, who is supposed to have derived his information from priests, while Ctesias consulted official chronicles. Of this work all that remains is an abridgment in Photius of the Persian part of the history, and the fragments contained in Diodorus and other historians. Ctesias also wrote a treatise on India in one book, of which there is also an abridgment in Photius. It served at one time to discredit his authority as a historian, but the work is to be regarded only as an account of India as it was known to the Persians, and some things in his description formerly supposed fabulous have recently been proved to be well founded. Of his other works little is known. An edition of the works of Ctesias, in 8vo, with an introductory essay on his life and writings, was published, by Bähr (Frankfort, in 1824). See Dr. Smith's Dictionary of Greek and Roman Biography and Mythology.

CUBA, the largest and most westerly of the Antilles. Its configuration, extent, geographical position, great number of ports, fertility, and climate, contribute to render it one of the most interesting countries of America. Its length from Cape St. Antonio to Havana, and thence to Cape Maysi, is 750 miles, and its breadth N. to S. varies from under 20 to over 120 miles; length of coast, excluding minute indentations, about 1600 miles; area, 45,870 square miles, of which about a seventh is supposed to be under cultivation or in pasture. The Gulf of Mexico,

which is very nearly of a circular form, is closed by the island of Cuba, with the exception of two narrow passages, the one to the south, between Cape Catoche and Cape St. Antonio, and the other to the north, between Havana and the Florida reefs. Along the coast of Cuba are many keys and small islands, which are included in the same government with the large island. The navigation of the coast is very unsafe, on account of the rocks and shoals which encompass it almost without interruption, and often extend from 2 to 3 miles into the sea. The broken outline of this vast extent of coast, however, affords a great many ports and anchoring places, which are equally safe and easy of access. The chief commercial ports are, on the north, Havana, Matanzas, Cardenas, Sagua, Remedios; on the south, Santiago, Trinidad, Cienfuegos, and Guantanamo. There are several other fine harbours, such as those of Nipe and Naranjo. A ridge of mountains traverses the whole of the island from the east to the west, dividing it into two parts. At the foot of these the country opens into extensive savannahs. A considerable number of small streams from these heights water the island on both sides. These streams abound in fish of different kinds, and are said to bring down considerable quantities of gold.

Geology and Mineralogy.—Geologically, the island of Cuba may be shortly described as composed of granite, gneiss, syenite, and euphotide, overlain by secondary and tertiary formations, chiefly calcareous, containing numerous fossils, and through which the primitive rocks are often protruded. The mountains of the south-east part of the island appear to have a submarine connection with the heights of Hayti and Jamaica; and in this part of the island earthquakes are frequently felt, though they rarely extend to the west part. In some localities the limestone is exceedingly porous and cavernous, absorbing rapidly the tropical rains, and even engulfing considerable rivers. The latest calcareous formation is entirely coralliferous, and goes on at present accumulating on all the coasts, and contains numerous animal remains. No traces of volcanic eruption, properly so called, have hitherto been discovered.

The mineral riches of Cuba have not yet been fully explored, but it is known to be not deficient in this respect. The precious metals have been found in it, but not in sufficient quantity to repay the cost and labour of working. Copper is more abundant, there being several extensive mines of this metal in active operation in the Sierra del Cobre. The average produce of these mines is about 27 per cent., but some specimens have yielded as high as 53 per cent. They were wrought by the Spaniards at an early period, but had been abandoned for upwards of a century, when they were re-opened about 1828. Mines of alum and copperas were also at one time worked in the mountains of Juragua, but were speedily abandoned. Coal has been discovered in the vicinity of Havana. A variegated serpentine marble, chalcedony, magnesia, iron pyrites, quartz, and feldspar slates and schists have been found in various places. The schistose formation shows itself most conspicuously at the base of the mountains of San Juan and Trinidad, where great masses of slate are to be found of a dark-blue colour, and of a pyritous and bituminous quality. In the quarries near Havana a thick slate is found, fit for floors and pavements. Bitumen is plentiful, and exhibits itself under a variety of aspects, sometimes in a liquid state, like naphtha, issuing from the fissures of the rocks; sometimes soft, like wax or half-melted resin. There are many mineral springs in different parts of the island, and on the north coast are extensive lagoons which, in dry years, produce immense quantities of marine salt.

Climate, Soil, Vegetable Productions, &c.—The climate is hot and dry during the greater part of the year, but is, on the whole, more temperate than that of some other islands in the same latitude. The mean annual temperature at Havana is about 78°; the maximum is 91° 24′, the minimum 50°. On the heights south of Havana the mean temperature is about 73° 30′; the temperature of July 83° 30′, of January 62°. In Santiago de Cuba the mean temperature is upwards of 80°. Rain often descends in torrents, from July to September, and occasional showers fall for a month or two before and after these periods. In December and January the air is much cooled by the north winds. No snow is known to fall on the highest mountains; but frost occurs occasionally, forming ice of several lines in thickness. Hail-storms are rare, and hurricanes much less frequent than in the other Antilles. The vegetation of Cuba is exceedingly luxuriant. Forests of mahogany, ebony, cedar, fustic, and other useful woods, abound; and the fields are covered with flowers and odoriferous plants. The principal cereal cultivated is the indigenous maize, or Indian-corn. Two crops of it are obtained in the year. Rice is also produced in considerable quantities in many districts; but the principal crops are sugar, coffee, and tobacco, also a little cotton, cocoa, and indigo. A considerable extent of country is appropriated also to cattle-breeding farms, and to *potreros*, farms on which vegetables are raised, maize, mallochia grass, cassava, onions, garlic, poultry, wax, and honey. The principal fruits of the island are the pine-apple or ananas, oranges, shaddocks, plantains, bananas, melons, lemons, and sweet limes; figs and strawberries are also to be had.

Animals.—The most valuable domestic animals are the ox, horse, and pig, which form a large proportion of the wealth of the island; the sheep, goat, and mule are inferior in quality and numbers. Jackasses and rabbits have been introduced, and dogs and cats are numerous. The domestic fowls comprise the cocks and hens of Europe, geese, turkeys, pigeons, and peacocks. Among the few indigenous mammals of which Cuba can boast we may mention two species of aguti and an opossum (*Philander dorsiger*). The sylvan birds are numerous and in great variety; but birds of prey are few; the principal is the bald-headed vulture, or turkey-buzzard. Sand-crabs swarm in some places. Snakes and reptiles are not very numerous. The most remarkable are the maja, 12 or 14 feet in length and 18 or 20 inches in circumference; and the juba, about 6 feet in length; the latter is considered more dangerous than the former, and is also more common. Phosphorescent insects abound, as do also those of a noxious description, including ants, mosquitoes, and a singularly disgusting-looking spider with a poisonous sting. There are also centipedes and scorpions. The shores abound with turtle, and in the deep gulfs and bays the crocodile and cayman are found, the latter more especially where the water is stagnant. The manati is met with in the deep pools of fresh water, and the iguana, a sort of lizard, on the banks of streams, bays, and lagoons. Fish are said to be abundant, particularly on the north coast, but no fishery of any note has been yet established.

Agriculture, &c.—Sugar, coffee, and tobacco form the principal objects of cultivation, but of these the first is by far the most important. The quantity of sugar produced in Cuba, per acre, is estimated at a little more than 2000 lbs., being somewhat better than Jamaica, but greatly short of Barbadoes. The coffee plantations are confined almost solely to the north side of the island, the only part where the precise degree of heat most favourable to the growth of the plant is to be found. The best season for planting the trees is in the middle of the month of May;

the gathering commences in August, but November and December are the most active and important months of the harvest. The buildings on a coffee estate in Cuba are generally of a very humble description, and the circumstances of the proprietor, in most instances, inferior to those of the sugar grower. The export of coffee from Cuba, unlike that of sugar, is on the decline. The best tobacco is grown in the district of Vuelta de Abajo, a little west of the Havana, about 84 miles in length and 21 in breadth, and here the mildest and finest flavoured is produced on the banks of the San Sebastian, most of which is made into cigars, celebrated under the name of Havana cigars, reckoned the best made anywhere. Previously to 1820 the cultivation and sale of tobacco were subjected to the same sort of monopoly in Cuba as in Mexico; but at the period referred to the trade was thrown open. The cattle-breeding farms of Cuba, though numerous, as already stated, are said to be by no means in a prosperous condition. They are generally let with the stock upon them, at the rate of two or three dollars a head, for a term of five years, with an obligation to leave the property in good condition, and to account for the stock which was on it when let; all the increase during the term belonging to the tenant.

Manufactures, Commerce, &c.—The manufactures of Cuba are confined to the making of sugar, molasses, and cigars, bleaching wax, and the preparation of coffee. The cigars the lower orders smoke—and in Cuba every one smokes, man, woman, and child—cost about four dollars or 16*s.* per 1000. From the same quality of tobacco the first, second, and third class of cigars are made. When the cigars are twisted, and before they are sorted, they are said to be 'en revolucion.' They are now sorted and picked, and about 25 per cent. of the whole are chosen, and these are called of the first-class; the rest are divided into seconds and thirds, and the prices vary from eight to fifteen dollars per 1000. The chief imports are grain and flour, salted provisions, brandy, wines, spices, fruits, and cotton, linen, and woollen manufactures. The exports are sugar, molasses, coffee, tobacco, mahogany, cedar, fustic, and other valuable timbers, fruits, and the precious metals.

The production of sugar has been for many years an important and increasing staple trade of Cuba. Of late years the introduction of coolies, chiefly from China, has had some effect upon the character of the labour employed in the cultivation of the sugar-cane. The free labour of the coolie is said to be less costly than that of the slave, and it is asserted that the planters prefer the coolie to the negro, not only for his greater physical capacity for work, but also for his more uniform obedience and industry. Slavery was abolished by the republican government of Spain in 1873. The total export of sugar from the island in 1870 amounted to the large quantity of 659,792 tons; in 1871 it was 470,941 tons. The quantities of molasses exported in the above years were respectively 213,389 and 152,524 tons. Havana is the port at which by far the largest quantity of the sugar is exported. More of the sugar is sent to the United States than to any other country, but Great Britain stands next. A recent blue-book states that the total value of the yearly products of Cuba is not accurately known, even in Spain.

The following shows the number and tonnage of the American, Spanish, British, and French vessels entered at the port of Havana in the years 1870 and 1871:—

	American.		Spanish.		British.		French.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1870..	738	361,658	677	181,792	340	125,572	35	37,490
1871..	740	335,158	670	191,022	262	77,504	34	34,932

Money, Weights, &c.—Accounts are kept in dollars, reals, and maravedis, respectively worth about 4*s.* 2*d.*, 6½*d.*, and 0·47*d.*; the dollar being divided into 8 hard reals or 34 maravedis. The gold coins are the doubloon or ounce, and its subdivisions. The doubloon is worth about 10 dollars, or £3, 10*s.* 10*d.*, but varies in price according to weight, and sometimes demand. The principal weights and measures are the pound, equal to about 1 lb. ¼ oz. avoirdupois, making 100 lbs. or libras equal to 101 lbs. 7 oz. avoirdupois. The vara is equal to 33·384 inches, or 108 varas = 100 yards. The fanega is equal to 3 bushels nearly, or 200 lbs. Spanish. The arroba, of liquid measure, is equal to 4245 gallons.

The roads in Cuba, formerly in a most wretched condition, have latterly been much improved; and the internal traffic of the island is now facilitated by the railways, the length of which in operation in 1868 amounted to about 380 miles. The first, from Havana to Guines, a distance of 46 miles by railway, was opened in 1837. Steam-vessels also ply between Havana and other parts of the coast. No foreigner can land on the island without procuring the security of a native of responsibility for his good behaviour.

The government of Cuba, like that of Spain, to which it belongs, is at present in an unsettled state. Education has of late years made some progress under government inspection, but great ignorance still prevails in the country districts. There is a university in Havana. The nominally prevailing religion hitherto has been Roman Catholic; but on all these matters the country is in a state of transition, and cannot at present be said to have any settled institutions.

History.—Cuba was first discovered by Columbus, on October 28, 1492, who revisited it in 1494, and again in 1502. In 1511 the Spaniards formed the first settlement on the island, and the native inhabitants were soon extirpated. Negro slaves were introduced in 1524. In 1762 Havana was taken possession of by the British, but was restored to the Spaniards in the following year. From this period the history of Cuba presents nothing more interesting than a catalogue of captains-general and bishops, down to the years 1809–11, when the ports were opened to the ships and trade of foreign countries; during which period fifty-four or fifty-six captains-general have in turn ruled the island. In 1820 Spain agreed by a treaty with England to put a stop to the slave-trade, but the treaty was wholly neglected in Cuba. From 1817 to 1842 the number of slaves imported reached 13,000 per annum. In 1845 a law was passed making the introduction of slaves criminal, but for many years it did not put a stop to the traffic. Slavery was abolished in 1873. The next events of importance in its history are the piratical attempts made in May, 1850, and again in August, 1851, by a band of United States adventurers, under the command of a Spaniard named Narcisso Lopez, to seize upon the island. Both expeditions signally failed in consequence of the determined front shown by the Cubans to the invaders. An insurrectionary struggle against the mother country has been maintained in Cuba since 1868 by a party in favour of separation from Spain. Pop. in 1867, 1,414,508.

CUBATURE OF A SOLID, in geometry, the measuring of the space contained in it, or finding the solid content of it.

CUBE, in geometry, a solid body contained by six equal square sides. The solid content of any cube is found by multiplying the superficial area of one of the sides by the height; or, what comes to the same thing, by multiplying the number that expresses the length of one of the edges by itself, and the product thus found by that number again. Cubes are to one

another in the triplicate ratio of their diagonals; and a cube is supposed to be generated by the motion of a square plane along a line equal to one of its sides, and at right angles to it; whence it follows that the planes of all sections parallel to the base are squares equal to the base, and consequently to one another.

CUBE, or CUBIC NUMBER, in arithmetic, that which is produced by the multiplication of a square number by its root; thus 64 is a cube number, and arises by multiplying 16, the square of 4, by the root 4.

CUBE, or CUBIC QUANTITY, in algebra, the third power in a series of geometrical proportionals continued; as, a is the root, a, a the square, and a, a, a the cube.

CUBEBS, the dried unripe fruit of *Cubeba officinalis*, or *Piper cubeba*, a native of Java. They resemble black pepper, and are globular, wrinkled, blackish-brown, with a warm, even acrid taste, and peculiar odour. They have been used in medicine from the time of Hippocrates, and are still employed as a stimulant. In small doses they promote digestion, but in larger quantities they excite burning pain, nausea, vomiting, and may even affect the nerves. By distillation with water, a volatile oil is obtained, which is sometimes administered in capsules, or on sugar, and the tincture is also employed.

CUBE ROOT of any number or quantity is a number or quantity which, if multiplied into itself, and then again by the product thence arising, gives a product equal to the number or quantity whereof it is the cube root, as 2 is the cube root of 8, because twice 2 are 4, and twice 4 are 8.

CUBIC FOOT of any substance, so much of it as is contained in a cube whose side is 1 foot. See CUBE.

CUBIT, in the mensuration of the ancients, a long measure, equal to the length of a man's arm, from the elbow to the tip of the fingers. Dr. Arbuthnot makes the English cubit equal to 18 inches, the Roman cubit equal to 1 foot 5·406 inches, and the chief cubit of Scripture equal to 1 foot 9·888 inches.

CUCKINGSTOOL, an ancient instrument of punishment, described in Doomsday Book as *cathedra stercoris*. Scolds, cheating bakers, or brewers, and other petty offenders were led to this stool and immerged over head and ears *in stercore*, or stinking water.

CUCKOO (*Cuculus*, Linn.), a genus of birds characterized by a bill of moderate size, short tarsi, and tail composed of ten feathers. The bill is compressed, and slightly arched. The greater number of species belonging to this genus are found on the ancient continent. Only one species is a native of Great Britain, and very few belong to Europe. In America no true cuckoos are found, for the genus *Coccyzus* differs very essentially from them in its habits. The cuckoos are especially distinguished by their habit of laying their eggs in the nests of other, and generally much smaller birds. What is still more singular, it has been found by very careful observations that the young cuckoo, shortly after being hatched, throws out of the nest all the other young or eggs, and thus engrosses to itself the whole parental care of the bird in whose nest it has been lodged. The manner in which this ejectment is effected is thus described by Jenner in the second part of the Philosophical Transactions for 1788, article xiv.:—'The little animal, with the assistance of its rump and wings, contrived to get the bird on its back, and, making a lodgment for the burden by elevating its elbows, clambered backwards with it up the side of the nest till it reached the top, where, resting for a moment, it threw off its load with a jerk, and quite disengaged it from the nest. It remained in this situation a short time, feeling about with the extremity of its wings as if to be convinced whether the business was properly executed, and then dropped into the nest again. With these (the extremities of its wings) I have often seen it examine, as it were, an egg or nestling before it began its operations; and the nice sensibility which these parts appeared to possess seemed sufficient to compensate the want of sight, which as yet it was destitute of. I afterwards put in an egg, and this by a similar process was conveyed to the edge of the nest and thrown out. These experiments I have since repeated several times in different nests, and have always found the young cuckoo disposed to act in the same manner. In climbing up the nest it sometimes drops its burden, and thus is foiled in its endeavours; but after a little respite the work is resumed, and goes on almost incessantly till it is effected. It is wonderful to see the extraordinary exertion of the young cuckoo, when it is only two or three days old, if a bird be put in the nest with it that is too weighty for it to lift out. In this state it seems ever restless and uneasy. But this disposition for turning out its companions begins to decline from the time it is two or three till it is twelve days old, when, as far as I have seen, it ceases. Indeed, the disposition for throwing out the egg appears to cease a few days sooner, for I have frequently seen the young cuckoo, after it has been hatched nine or ten days, remove a nestling that had been placed in the nest with it, when it suffered an egg, put there at the same time, to remain unmolested. The singularity of its shape is well adapted to these purposes; for, different from other newly hatched birds, its back, from the scapulæ downwards, is very broad, with a considerable depression in the middle. This depression seems formed by nature for the purpose of giving a more secure lodgment to the egg of the hedge-sparrow or its young one when the young cuckoo is employed in removing either of them from the nest. When it is about twelve days old this cavity is quite filled up, and then the back assumes the shape of nestling birds in general. A young cuckoo that had been hatched by a hedge-sparrow about four hours was confined in the nest in such a manner that it could not possibly turn out the young hedge-sparrows which were hatched at the same time, though it was almost incessantly making attempts to effect it. The consequence was, the old birds fed the whole alike, and appeared in every respect to pay the same attention to the young cuckoo as to their own young until the thirteenth day, when the nest was unfortunately plundered. The smallness of the cuckoo's egg, in proportion to the size of the bird, is a circumstance that hitherto I believe has escaped the notice of the ornithologist. So great is the disproportion that it is in general smaller than that of the house-sparrow, whereas the difference in the size of the birds is nearly as 5 to 1. I have used the term *in general* because eggs produced at different times by the same bird vary very much in size. I have found a cuckoo's egg so light that it weighed only 43 grains, and one so heavy that it weighed 55 grains. The colour of the cuckoo's eggs is extremely variable. Some, both in ground and pencilling, very much resemble the house-sparrow's; some are distinctly covered with bran-coloured spots; and others are marked with lines of black, resembling in some measure the eggs of the yellow-hammer.'

The cause of this singular habit of the common cuckoo of Europe (*Cuculus canorus*) has been long a subject of discussion without having been very satisfactorily determined. The opinion of the observer above cited appears to be as near the truth as we

may hope to arrive. He attributes it to the short stay made by the bird in the country where it is under the necessity of propagating its species. Were it not to resort to some such expedient it would be impossible that the species could be continued. The cuckoo first appears in England about the 17th of April. Its egg is not ready for incubation sooner than the middle of May. A fortnight is taken up by the sitting bird in hatching the egg. The bird generally continues three weeks in the nest before it flies. The foster parents feed it for more than five weeks after this period; so that if the cuckoo took care of its own eggs and young the newly hatched bird would not be fit to provide for itself before its parent would be instinctively directed to seek some new residence, and be thus compelled to abandon its young one, for the old cuckoos take their final leave before the first week in July. The young cuckoos forsake the nest as soon as fully fledged and capable of providing for themselves. Their migrations from Europe are thought to be chiefly directed towards Africa; thence they regularly return with the spring, and from some dead tree or bare bough the male pours forth his monotonous song, *cuckoo! cuckoo!*

In America there is a bird of a very different genus which resembles the cuckoo in depositing its egg in the nests of other birds, to be fostered by them. It is called the cow-bunting (*Molothrus pecoris*). See COW-BUNTING.

CUCUMBER. The common cucumber is the fruit of *Cucumis sativus*, belonging to the Cucurbitaceæ or gourd order. It is supposed to have been originally imported into Europe from the Levant. Several species of the genus *Cucumis* are powerfully cathartic. *C. melo* is the common melon, supposed to be a native of Persia. *Citrullus colocynthis*, belonging to an allied genus, produces coloquintida, or bitter-apple, the pulp of which is the colocynth of the shops. A species of another genus, *Cucurbita citrullus*, yields the water-melon; and *C. ovifera*, vegetable-marrow. *Ecbalium purgans* is the squirting cucumber, so called from the elastic force by which its seeds are scattered.

CUCURBITACEÆ, the gourd order. They are large herbaceous plants, annual or perennial, with alternate leaves palmately veined and scabrous, and unisexual flowers. The corolla is monopetalous, regular, and with five lobes, often plaited longitudinally; and the petals, usually either yellow, white, or green, are deeply veined. The fruit fleshy, and more or less succulent. The stems are scabrous, and the general habit is climbing or trailing, by means of tendrils. The order contains at least fifty-six genera, and about 300 known species, and abounds in useful or remarkable plants, including the melon, cucumber, colocynth, bryony, &c. They are natives of both hemispheres, chiefly within the tropics. The annuals, however, easily submit to the summer of northern climates, and hence are common in European gardens.

CUCURBITE, or GOURD, so called from its resemblance to the vegetable, was a flask forming the lower part or *body* of a distilling apparatus formerly in use among chemists. On the top of it was placed the capital or alembic, furnished sometimes with a cold-water refrigeratory, and the junction was made tight with a lute. Later the whole apparatus was called an *alembic*. The old complicated forms have long been substituted by the retort, which is a development of the *cucurbita curra*.

CUCUTA, a valley, Colombia, province Pamplona, on the Venezuelan frontier; lat. 7° 30′ N.; lon. 72° 10′ W.; between the cities of Pamplona and San Christoval, remarkable for its fertility and excellent breed of mules. Cacao, of the finest quality, is raised in the greatest abundance. This valley was discovered by Juan de San Martin in 1534.

CUDBEAR. The *Lecanora tartarea* is a lichen which grows in Norway and Sweden, in Scotland, and other parts of Europe, and of which considerable quantities were exported from Sweden even during last century. In West Gothland a fine crimson colour, called *byttelet* in Sweden, is prepared from it. A hundred years ago a patent for the manufacture of a purple colour from it was obtained by Dr. Cuthbert Gordon, who, to connect it with his maternal name, Cuthbert, designated it *cudbear*. About 1777 a manufactory of this substance was started at Leith by a Mr. Macintosh, of Glasgow, under the superintendence, it is said, of Dr. Gordon, but it was afterwards removed to Glasgow, as a more suitable locality, realized a very handsome fortune to the proprietor, and was carried on afterwards by his son. Works were also started at Liverpool and London, and cudbear became an important commercial article. The lichen which was first used in the Glasgow work was brought from the Highlands, but when the supply was exhausted, large quantities were imported from Sweden and Norway. The process consisted in steeping the lichen and then treating it in covered vessels with ammonia, obtained first from animal sources, but subsequently from gas liquor, which was preferred, as the colour was found to depend on the purity of the ammonia. When the colour was thought sufficiently developed the mass was dried in the air and powdered. There is no essential difference, therefore, between cudbear and archil (which see). It has a purplish red colour, a rather pleasant smell, and is somewhat soluble in hot water. It has been specially used for dyeing wool different shades of crimson, but from its fleeting character, cannot well be used alone; but it acts advantageously as a ground for other dyes. It gives a number of mordant colours, but these are also apt to fade. It has not been used in cotton or linen dyeing.

CUDDALORE, a maritime town, Hindustan, Carnatic, and one of the largest and most populous in the south of India, 17 miles S. by W. of Pondicherry, on the right bank of the Trivadi, at its embouchure in the Bay of Bengal. It has a court-house, a custom-house, and some trade, particularly in exporting to Madras the cottons produced in this part of the peninsula. It is one of the principal stations for soldiers who have been invalided, or who choose to remain in India after having obtained their discharge. This place has been the scene of many contests, and has frequently changed masters. It was captured from the French by the British army under Colonel Coote in 1760, and continued under the dominion of the Nabob of Arcot until 1782, when it was taken by the Rajah of Mysore, with the assistance of some French troops. In June, 1783, the town was attacked by a body of British troops under General Stuart, which sustained heavy loss, and was repeatedly defeated in attempting to carry the place by assault. In 1795 Cuddalore, with the remainder of the province, was consigned by treaty to the East India Company, which retained it till it passed to the crown.

CUDDAPAH, a district and town, Hindustan, presidency Madras. The district lies between lat. 13° 5′ and 16° 20′ N.; and lon. 77° 48′ and 79° 50′ E.; area, 12,970 square miles. It is bounded N. by Kurnool and Guntoor; E. by Nellore and North Arcot; S. by North Arcot and Mysore; and W. by Bellary and Kurnool. It is traversed N. to S. by the Eastern Ghauts, and watered by the Pennar and its affluents, the Gondegam, and other smaller streams. Though the district be considerably elevated above the sea, the heat in April and May is intense; and the water during the hot season is brackish, but during the

rains it is sweet and good. Soda is found in the hills to the south-west of the town of Cuddapah, and is used by the natives in place of soap. Salt and saltpetre likewise abound, and are easily procurable. On the plain round Cuddapah hæmatite and fusiform iron ores are found. On the banks of the Pennar, about 7 miles north-east the town of Cuddapah, are diamond mines, which have been wrought for several hundred years, and in which gems of considerable value have been found. The mines have not recently proved profitable. Nearly a fifth of the district is under grain cultivation. Cotton is likewise pretty extensively grown.—The town lies on a small river of same name, an affluent of the Pennar, 140 miles north-west Madras; lat. 14° 32′ N.; lon. 78° 55′ E. It contains a residence of the rajah, now converted into a court-house and prison, and was formerly the capital of an independent Patan state. Its importance is at present almost entirely derived from the cantonment, situated about 3 miles to the east, on the opposite side of the river.

CUDWORTH, Ralph, a learned English divine and philosopher, was born at Aller, in Somersetshire, of which parish his father was rector, in 1617. He was admitted a pensioner of Emanuel College, Cambridge, at the age of thirteen. His diligence as an academical student was very great; and in 1639 he took the degree of M.A., and was elected fellow of his college. He became so eminent as a tutor, that the number of his pupils exceeded all precedent, and in due time he was presented by his college to the rectory of North Cadbury, in Somersetshire. In the year 1642 he published a Discourse concerning the True Nature of the Lord's Supper, and The Union of Christ and the Church Shadowed, or in a Shadow. The first of these productions, which maintained that the Lord's supper is a feast upon a sacrifice, produced considerable controversy long after the author's death. In 1644 he took the degree of B.D., and was chosen master of Clare Hall, and in the following year was made regius professor of Hebrew. In 1651 he was made D.D., and in 1654 chosen master of Christ's College, Cambridge; where, having taken a wife, he spent the remainder of his days. In 1678 he published his grand work, entitled The True Intellectual System of the Universe; the First Part, wherein all the Reason and Philosophy of Atheism is confuted, and its Impossibility demonstrated (folio). This work, which is an immense storehouse of ancient learning, was intended, in the first instance, to be an essay against the doctrine of necessity only; but perceiving that this doctrine was maintained by several persons upon different principles, he distributed their opinions under three different heads, which he intended to treat of in three books; but his Intellectual System is directed only against the first, viz. the material necessity of all things without a God, or absolute atheism. It is a work of great power and erudition, although the attachment of the author to the Platonism of the Alexandrian school has led him to advance some opinions which border on incomprehensibility and mysticism. The moral as well as intellectual character of this eminent scholar stood very high; and he died universally respected, in 1688, in the seventy-first year of his age.

CUENCA (anciently *Canca*), a city of Spain, in New Castile, capital of a province; 85 miles E.S.E. Madrid; lon. 2° 16′ W.; lat. 40° 10′ N.; pop. 7375. It is a bishop's see, and contains a cathedral. It was built by the Moors, and stands on a high and craggy hill, about 3400 feet above sea-level, between the rivers Jucar and Huescar, which makes it naturally strong. Here the painter Salmeron and the famous Jesuit Molina were born. The north and east part of the province is mountainous, and fit only for sheep pasture; the other parts are fertile, producing corn, hemp, fruit, &c. Population of the province, 236,000; square miles, 12,177.

CUENCA, Sierra de, a chain of mountains, a section of the Iberian range, which runs through the Spanish province of the same name.

CUENZA, or Santa Ana de Cuenza, a town of Ecuador, capital of a province; 150 miles S. Quito; pop. 20,000. The streets are straight and broad, but the houses, mostly of *adobes*, or unburned bricks, are mean. The environs are very fertile and pleasant. The town, which, next to Quito, is the most important in Ecuador, contains a cathedral, two churches, four convents, two nunneries, an hospital, a chamber of finance, &c. The chief trade is in grain, Peruvian bark, sugar, &c.

CUEVA, Juan de la, a poet, born in Seville about the middle of the sixteenth century. A great facility in the composition of verses, in which Ovid was his model, determined him to apply himself to the dramatic art, in which Torres Naharro had successfully resisted the attempts of some learned theatrical amateurs to force the Greek and Latin drama upon the people. In connection with Naharro, Lope de Rueda, and Christopher de Castillejo, he confirmed the old division into *comedias divinas y humanas*, while he made his pieces more interesting than those of his predecessors, by introducing greater variety in the *dramatis personæ*, by more finished verses, and by the division into three *jornados*, or acts. His works, which are now rare in Spain, may be found in the Parnaso Español. The earliest of his compositions are Poesias Lyricas (Seville, 1582), of the same character with the Coro Febeo de Romances Historiales (Seville, 1588). His heroic poem, La Conquista de la Betica, in twenty cantos (Seville, 1602, also in Fernandez's collection, vols. xiv. xv.), has beauties enough in the execution to make amends for the defects of the plan. The Comedias y Tragedias, published at Seville (1583–88), were received with applause in their time, in this poetical city, but offended, even then, by the introduction of allegorical personages in the action. In the Parnaso Español there is a work of Cueva's, written in terzets, on the art of poetry, which contains many interesting facts with regard to the old Spanish drama. Cueva died at the commencement of the seventeenth century.

CUFIC WRITING and CUFIC COINS. The written characters of which the Arabians now make use, and with which we meet in printed works, viz. the Neskhi characters, are an invention of the fourth century of the Hegira. Before this time the *Cufic characters*, so called from the town of Cufa, or Kufa, where they are said to have been invented, were in use. These old characters have so much resemblance to the ancient Syriac writing, the Estrangelo, that it hardly admits of a doubt that the Arabians borrowed them from the inhabitants of Syria. Historical traditions confirm this supposition. The Cufic characters, and perhaps others at an earlier date which essentially resembled them, were probably first introduced among the Arabians a short time before Mohammed. Although we are at present ignorant of the characters which were previously in use among them, and although the imperfect accounts of the Mussulman writers throw very little light upon the subject, yet it is scarcely credible that the Arabians remained destitute of a written character until the sixth century of the Christian era. Perhaps traces of the earlier character are to be found in the Palmyrene and Phœnician inscriptions, and also on the coins of the Sassanides. We find the transition of the Cufic to the Neskhi on the ruins of Chilminar. The influence which the school of Cufa exerted on Islamism caused the use of the character which proceeded

from it; and when the others had fallen into oblivion, *Cufic writing* was the name commonly applied to all kinds of Arabic writing previous to the change made by Ebn Mokla. A knowledge of it is important on account of the many monuments in which it is preserved; especially the coins inscribed with Cufic characters and made in the first centuries of the Hegira.

Under the name of *Cufic coins* are comprehended the ancient coins of the Mohammedan princes, generally without emblems, inscribed and circumscribed on both sides, which have been found in modern times to be important documents for illustrating the history, languages, and religions of the East. The little art displayed in the impression of these coins, is the reason why the earlier travellers through the East too often overlooked them. These coins are some of gold (*dinar*), others of silver (*dirhem*), and others of brass (*fals*). The silver coins, however, are the most frequent, and the discovery of large treasures of them on the shores of the Baltic has particularly attracted to them the attention of learned men. Their form was borrowed by the Arabian caliphs from that of the Byzantine and Chosroean silver and copper coins. They are to be considered as the earliest of this class of coins, now daily increasing. Agreeably to Adler's suggestion, who first accurately investigated these coins (Museum Cuficum Borgianum), they are divided, according to the dynasties under which they were made, into twelve classes, in which, without any reference to the country to which they belong, everything which ought to be connected with them is combined. In the countries around the Baltic, as well as in the central provinces of European Russia, the silver coins most frequently found are those of the caliphs, the Ommiades as well as the Abbassides; then those of the emirs of the Soffarides, the Buwaihides, &c., but especially of the dynasty of the Samanides, which were struck between the middle of the seventh and the beginning of the eleventh centuries of the Christian era. Those of the tenth century are the most common. This fact has not been satisfactorily explained. Amber, girls for the harem, as well as costly furs, which the Russians at that time brought for sale to the Wolga, according to Fosslan's account of a journey at the beginning of the tenth century of the Christian era, appear to have been most frequently exchanged for them. Gold, in this commerce, was used only in bars; and in order to make payments in their transactions with greater facility, or in order to have a medium of exchange for things of little value, the coins were broken; of which we have abundant evidence. By accurate investigations in the countries where this money is found, the diligence and learning of the orientalists Adler, Reiske, Ol. Tychsen, Silv. de Sacy, Hallenberg, Malmstroem, Rasmussen, Fraehn, Castiglioni (who has published a valuable work upon the Cufic coins of the imperial museum at Milan), Münter and Th. Tychsen succeeded in arranging a tolerably perfect series of the several dynasties, and much additional information has been accumulated by Dorn, Stickel, De Saulcy, Olshausen, and Soret.

In connection with these coins are to be considered the small pieces of glass which were introduced, particularly in Sicily, under the dominion of the Mohammedans, instead of money, or perhaps under the sanction of public authority obtained currency as standards of the weight of coins. Among Cufic coins those are particularly sought for which bear images, because the forms represented upon them appear to be opposed to the precepts of the Koran. But their commerce with the Greeks may at first have made the engravers of the Mohammedan coins less strict; and in the course of time they ventured to give them figures agreeable to the peculiarities of the oriental taste, in doing which they were aided by the armorial bearings (*tamghas*) of the princes of the Turkish family. Finally they marked them with zodiacal and planetary figures, to which they attributed the power of amulets. The original use of these coins is made still more manifest from inscriptions in many languages; even Russian-Arabic coins are found in rich cabinets.

CUIRASS, an article of defensive armour, protecting the body both before and behind. Meyrick, in his dissertation on ancient armour, has thus distinguished the cuirasses of different nations:—1. Leathern, with a belt of the same material, worn by the Medes and Persians before the reign of Cyrus the Great. 2. Plumated or scaled *loricæ* of steel, of which the fore-part covered the breast, the front of the thighs, and foreparts of the hands and legs; the posterior part, the back, neck, and whole of the head—both parts being united by *fibulæ* on the sides. These belonged to the Parthian cavalry. 3. Scales made of horses' hoofs, sewed together with the sinews of oxen, were worn by the Sarmatians. 4. The *mitra*, padded with wool, covered with flat rings or square pieces of brass, fastened at the sides, and cut round at the loins; the *thorax* or gorget; the *zoster* or girdle, to which was appended the *zoma*, a kind of petticoat,—belonged to the Homeric chiefs. 5. The Etruscans wore plain, scaled, laminated, ringed, or quilted cuirasses, with straps depending from them, either of leather solely, or plated with metal; and these straps, as well as the cuirasses, were adopted by the Romans, who termed them *loricæ*. On the Trajan Column the loricæ of the *hastati* and *principes* (the two first ranks) consist of several metal bands wrapped half round the body, and fastened before and behind over a leathern or quilted tunic. Sometimes the Roman cuirass was enriched with embossed figures. The loricæ of the *triarii* (the third rank) were of leather only. Domitian, according to Martial, adopted the Sarmatian cuirass, which he made of the hoofs of boars. The Roman cavalry of the early period did not wear loricæ; but even before the *cataphractes* of Constantine (who wore flexible armour of scales and plates and rings, held together by hooks and chains), we read of horsemen who were *loricati*, or protected by mail.

Among the moderns the Anglo-Saxons wore leathern cuirasses, which, towards the end of the ninth century, were formed of hides fitted close to the body, and jagged or cut into the shape of leaves below. The leathern cuirass, covered with rings, was appropriated to the blood-royal or chiefs of high rank. It was borrowed from the Gauls, and called *mael*, whence our coat of *mail*. The cuirass appears to have been disused in England in the time of Charles II., when bullet-proof silk was introduced. The lance having again become an offensive weapon, the cuirass has been revived among the European cavalry. The finest part of Napoleon I.'s cavalry were cuirassiers; and the weight of these heavily-armed soldiers gave great momentum to their charge. In the British army the Life Guards (red) and the Horse Guards (blue) wear the cuirass. Its utility, however, is doubtful.

CUJAS, Jacques, or Cujacius, son of Cujaus, a fuller in Toulouse, born about 1520. While yet a student of law under Arnauld Ferrier, he attracted attention by his industry and talents. After having delivered private lectures at Toulouse, he received an invitation to be professor of law at Cahors in 1554; but he had been there only a year when Margaret de Valois invited him, through her chancellor l'Hôpital, to Bourges, where he lectured till 1567. He then went to Valence, and gave great reputation

to the university of that place by his instructions. On account of the civil commotions in France, he returned to Bourges in 1575, and remained there, after a short stay at Paris, as teacher of the law, notwithstanding the most advantageous invitations to Bologna. Cujas owed his great reputation to his profound study of the original works on the Roman law, of which he had collected more than 500 manuscripts. The corrections which he made in ancient works on the law (to say nothing of a great many Greek and Latin works on other subjects) were remarkable for number and acuteness. In fact he may be considered as the founder of scientific jurisprudence. He made himself popular also by the interest which he took in the personal fortunes of his disciples, by his prudence in regard to the theological quarrels of his time, and his faithful adherence to the cause of Henry IV. His grief for the afflictions of his country is said to have accelerated his death (Oct. 4, 1590). He was in the habit of studying and writing lying on the carpet of his room, surrounded by huge piles of books and manuscripts. The booksellers at Lyons purchased his manuscripts for waste-paper. The edition of his works which he published himself in 1577 is correct, but incomplete. That by Fabrot (Paris, 1658, ten vols. folio) is complete, as also that of Venice-Modena (1758–82). The Promptuarium Operum Iac. Cujacii, auctore Dom. Albunensi (Naples, 1763, two vols. folio) is of great assistance in the study of this collection. Toulouse has erected a statue of him in 1850. See Cujas and his Contemporaries, by E. Spangenberg; or the Histoire de Cujas, by Berriat Saint-Prix.

CULDEES, a religious order which at one period had considerable establishments in almost every part of Great Britain and Ireland. The name is of uncertain etymology; some derive it from the Latin *colere*, to worship, and *Deus*, God; while others think they discover its origin in the Gaelic *kyldee* (from *cylle*, a cell, and *dee*, a house), a building composed of cells; or from *Ceile de*, an attendant on God. The history of the Culdees has acquired a factitious importance in the quarrels of the Episcopalians and Presbyterians; the latter asserting that they were of very great antiquity, and were Presbyterians in their ecclesiastical policy; the former maintaining that neither of these positions is correct, that there is no mention of them in the early British writers, but that they are first spoken of subsequent to the year 854, and that they then appear in the attitude of maintaining their right to confirm the election of the bishops of the several sees where they had establishments. Their origin is by some attributed to St. Columba in the middle of the sixth century. After having exercised a great influence throughout the country, they are said to have been overthrown by the increase of the Papal power, and the institution of monasteries more congenial to the aspiring views of the see of Rome. Until lately it was generally supposed that the Culdees were men of far greater sanctity and learning, and taught a far purer religion than the Catholic clergy; but recent researches show that the name is their only peculiarity.

CULLEN, a maritime town and parliamentary and municipal burgh, Scotland, in the county and 11½ miles west of the town of Banff. The town is beautifully situated on the bay of same name, is regularly built, and besides a large square or open market-place, consists of five principal streets, all of which are straight and remarkably well kept. On the east side of the market-place is a handsome building containing a court-room, a council chamber, and assembly-hall. The principal trade of the town is in fish. Ship and boat building are also prosecuted with some activity, and rope-making is carried on to a small extent. Cullen unites with Elgin, Banff, Macduff, Inverurie, Kintore, and Peterhead in returning a member to the House of Commons. Pop. 2056.

CULLEN, William, a celebrated physician and medical writer, was born at Hamilton, in the county of Lanark, in Scotland, in 1710. He was apprenticed to a surgeon and apothecary at Glasgow, after which he made some voyages to the West Indies as surgeon to a merchant vessel. He subsequently attended two winter sessions in Edinburgh, and was one of the founders of the Students' Association, now known as the Royal Medical Society. He then settled as a medical practitioner at Hamilton, where he formed a partnership with William Hunter, who afterwards became so distinguished. The object of their connection was not so much pecuniary emolument as mutual convenience in the pursuit of their profession. In 1740 Cullen took the degree of M.D., and settling at Glasgow, he was, in 1746, appointed lecturer on chemistry at the university there. In 1751 he was chosen regius professor of medicine. In 1756 he was invited to take the chemical professorship in the University of Edinburgh. In 1760 he was made lecturer on the *materia medica* there, and subsequently resigned the chemical chair to his pupil, Dr. Black. From 1766 to 1773 he gave, alternately with Dr. Gregory, annual courses of lectures on the theory and practice of physic—an arrangement which continued till the death of Dr. Gregory in 1773 left his rival in complete possession of the medical chair. As a lecturer on medicine Dr. Cullen exercised a great influence over the state of opinion relative to the mystery of that science. He successfully combated the specious doctrines of Boerhaave, depending on the humoral pathology; though he has not been equally successful in establishing his own system, which is founded on an enlarged view of the principles of Frederick Hoffmann. His death took place February 5, 1790. His principal works are Lectures on the Materia Medica; Synopsis Nosologiæ Methodicæ; and First Lines of the Practice of Physic, which must be considered as his *magnum opus*, and which, amidst all the recent fluctuations of opinion on medical theory, has retained its value. The Life of Cullen by Dr. Thomson (vol. i., 1832) was extended by his son, and finally completed in 1850 by Dr. Craigie, in a second volume.

CULLERA, a town, Spain, province and 25 miles S. by E. of Valencia, on the Jucar, and at the south base of a hill crowned by a strong castle. Its natural position makes it a place of military importance, and though its fortifications have been repeatedly dismantled, they were as often rebuilt, and are now in an efficient state. Pop. 7821.

CULLODEN MOOR, a heath in Scotland, 4 miles E. of Inverness. It is celebrated for a victory obtained April 27, 1746, by the Duke of Cumberland over Prince Charles Edward Stuart (the Pretender) and his adherents. The battle of Culloden was the last battle fought on British soil, and the termination of the attempts of the Stuart family to recover the throne of England. (See Charles Edward Stuart.) Cumberland had 7000 to 8000 men, while the Highlanders hardly mustered 4000. The troops of the Pretender were faint with fatigue and hunger when the battle began, but notwithstanding this they fought with spirit. The impetuous bravery of the Highlanders, however, at length yielded to the well-served artillery of the English. The victors massacred the wounded Highlanders on the field of battle. A monumental cairn and green mounds have been raised where the fiercest of the fight raged, and where many of the slain are buried.

CULM. See Kulm.

CULMINATION, in astronomy, the passing of a star through the meridian, because it has at that moment reached the highest point (*culmen*) of its apparent path in the sky. Hence culmination is used, metaphorically, for the condition of any person or thing arrived at the most brilliant or important part of its progress.

CULNA, or CHALANA, a town, Hindustan, province of Bengal, right bank of the Hooghly, 48 miles N.N.W. of Calcutta. There is here a circular area composed of two concentric circles, the outer one of which contains 108 temples, and the inner thirty-five. Here also is a flourishing school and mission station in connection with the Free Church of Scotland. It is one of the principal ports on the Hooghly for the Burdwan district, and carries on a thriving trade. Pop. estimated at 60,000.

CULROSS, an ancient royal burgh, Scotland, county Perth, finely situated on the north bank of the Forth, and long celebrated for its abbey, part of which has been completely modernized, and is now used as the parish church. The Earl of Dundonald, better known as Lord Cochrane, was born here. Pop. 467. It unites with Dunfermline, Stirling, South Queensferry, and Inverkeithing in sending a member to the House of Commons.

CULVERIN, a long cannon used in the sixteenth century. It carried a ball of about 18 lbs.; the demi-culverin carried one of about half that weight.

CUMÆ, a very ancient city in Campania, and the oldest colony of the Greeks in Italy, was founded about 1030 B.C. by colonists from Chalcis in Eubœa, and from Cyme (Greek *Kumē*) in Asia Minor. (See CYME.) The common belief of the inhabitants made it the residence of the Cumæan sibyl, though her home was really in Asia, and was no doubt transferred to Italy by the Asiatic colonists. Cumæ had a considerable territory, and a naval force. She was repeatedly attacked by the Etruscans and Umbrians, but defended herself with success. She founded Naples (Neapolis), and in Sicily Zancle or Messina. In 420 B.C. Cumæ was taken by the Campanians, and came with them under the power of Rome (345 B.C.) It was destroyed A.D. 1207; and all that remains of the city above ground are some ruins of an amphitheatre, of a small temple, and numerous masses of masonry, evidently of Roman construction. Cicero had a country seat in the neighbourhood of Cumæ.

CUMANA, a province, Venezuela, bounded N. and E. by the Caribbean Sea, S. by the Orinoco. In the western part, towards the coast, the soil is tolerably fertile. The eastern part is dry and sandy, affording nothing but an inexhaustible mine of marine and mineral salt. On the Orinoco the country is fit only for pasturage: other parts are exceedingly fertile. In the interior is a range of mountains, of which Tumeriquisi, the most elevated, is 5900 feet high. Pop. 75,828.

CUMANA, or NEW CORDOVA, a town of Venezuela, and capital of the province of the same name; pop. 12,000. It is situated near the mouth of the Gulf of Cariaco, about a mile from the sea, on an arid, sandy plain. The climate is hot, earthquakes are frequent, and the houses low and lightly built. It is the oldest European city in the New World, having been founded in 1523. On the 14th Dec. 1797, more than three-fourths of it were destroyed by an earthquake. The inhabitants carry on a considerable trade in cacao, sugar, tobacco, and other productions of the country. Cumana Bay has deep water, and is of a semicircular form, which defends it from the violence of the winds.

CUMBERLAND, the extreme north-western county of England. It is bounded on the N. by the Solway Firth, the Roman wall, and the river Liddel; on the W. by the Irish Sea; on the S. by Westmoreland and Lancashire; and on the E. by Northumberland and Durham; extreme length from north to south, 75 miles; breadth from east to west, 45 miles; area, 970,161 acres, rather more than a half of which is under cultivation. Before this island was conquered by the Romans Cumberland was probably occupied by the Caledonians; and Richard of Cirencester states that it formed a part of the territories of a British tribe called the Sistuntii. Under the Roman government it belonged to the province of Maxima Cæsariensis; and subsequently it was included in the Kingdom of Cumbria, which seems to have been the hereditary domain of the renowned King Arthur. The inhabitants maintained their independence after the other parts of England had been conquered by the Saxons; but they were at length obliged to submit to the yoke, and the county was made a part of the Anglo-Saxon Kingdom of Northumbria. At an early period the kings of Scotland acquired some kind of feudal authority over this county, which was the subject of frequent disputes between the English and Scottish sovereigns, but it ultimately remained in possession of the former; and it thus became exposed to the perpetual inroads of the Scots, and was the principal scene of border warfare, which had a considerable effect on the character and manners of the inhabitants. The union of the two kingdoms under James I. removed the causes of national animosity, but it was again devastated in the civil wars of the seventeenth century and in 1715 and 1745; since that time those habits of rapine and violence for which the borderers were distinguished have been exchanged for more peaceful pursuits, and commerce, literature, and the arts flourish in districts formerly desolated by continual warfare.

There is great variety of surface in different parts of the county. Two ranges of lofty mountains may be traced, one towards the north, to which belongs the ridge called Crossfell; and the other to the southwest, of which the highest peak is Skiddaw, 3166 feet above the level of the sea. Between these grand heights are many hills of various elevation, intersected by valleys, some of which are fertilized by brooks and rivers. The two largest rivers are the Eden and the Derwent; the Peterill, Caldew, Cocker, and Esk may also be mentioned. There are also several lakes, the largest of which are Ullswater, Derwentwater, Bassenthwaite-water, Loweswater, Crummock-water, Buttermere, Ennerdale-water, Wastwater, and Devoch-water; and there are likewise some smaller sheets of water provincially called *tarns*. The mountains of Cumberland are rich in mineral products. Plumbago, or black lead, was long almost solely procured from a mine in Borrowdale, which is now about exhausted; and the shire also furnishes abundance of lead, coal, and limestone, all which are largely exported; it has also blue slate, chiefly used in the county. The principal lead-mines are on the Derwentwater estate, belonging to the Greenwich Hospital. Here are copper-mines, but they are scarcely wrought at present. Iron, cobalt, antimony, manganese, and gypsum are also found here. The mountainous regions, termed *fells*, are, in general, externally rocky and barren; but the lower eminences are covered with herbage, furnishing food for sheep, and the low grounds are well watered and fruitful. The principal crops raised are oats, barley, wheat, and turnips, but the bulk of the inclosed lands is sown in clover and grass. The rearing of cattle and sheep is engaged in to a considerable extent. Cranberries grow abundantly in some parts of the county. Salmon is caught in the rivers; and that delicate fish, the char, is found in the lakes of Cumberland and Westmoreland. The

climate, in general, is cold, but dry and healthy. The scenery of the loftier mountains is bold, abrupt, and precipitous; whilst that part of the county which is included in the district of the lakes, displays scenes, the picturesque beauties of which have often been described both in poetry and prose. Among the principal remains of antiquity in this county are stone circles and other monuments, supposed to be Druidical; and the rampart called the Picts' Wall, which extended from Solway Firth, in the north-western part of Cumberland, to the mouth of the Tyne in Northumberland, and which was built by order of the Roman Emperor Severus, about A.D. 208. The five wards, or primary divisions of the county, are, Allerdale above Derwent, Allerdale below Derwent, Cumberland ward, Eskdale, and Leath ward; the only city is Carlisle, the capital; the other principal towns are the seaports, Whitehaven, Workington, and Maryport; and the inland towns, Penrith, Cockermouth, Longtown, Keswick, Egremont, Brampton, Wigton, Holme Cultram, and Kirk Oswald. For parliamentary purposes the county is divided into East and West Cumberland; each division returning two members to the House of Commons. Pop. 220,253.

CUMBERLAND, a post-town, and capital of Alleghany county, Maryland, on the Potomac, 179 miles by railroad from Baltimore. It contains a court-house, a jail, a market-house, banks, and several churches. The mountains in the vicinity abound in coal, great quantities of which are transported down the Potomac in flat and keel boats. It is well adapted for and much used by ocean steamers. Iron also is worked in the vicinity. Cumberland is traversed by the Baltimore and Ohio Railway, and is also the common centre from which several important lines diverge. Pop. 8056.

CUMBERLAND, a river which rises in the Cumberland Mountains, Virginia, and runs through Kentucky and Tennessee into the Ohio, 60 miles from the Mississippi, having a course of about 600 miles. It is navigable for steam-boats to Nashville, near 200 miles, and for boats of fifteen tons 300 miles farther. At certain seasons vessels of 400 tons may descend 400 miles to the Ohio.

CUMBERLAND, Ernest Augustus, Duke of. See Ernest.

CUMBERLAND, Richard, a dramatic and miscellaneous writer, son of Denison Cumberland, bishop of Clonfert, by the daughter of Dr. Bentley, was born in the master's lodge in Trinity College, Cambridge, February 19, 1732. He received his early education at Westminster, and in his fourteenth year was admitted of Trinity College, obtained his bachelor's degree at the age of eighteen, and soon after was elected fellow. He became private secretary to Lord Halifax, and made his first offering to the press in a small poem, entitled an Elegy written on St. Mark's Eve, which obtained but little notice. His tragedy entitled the Banishment of Cicero was rejected by Garrick, and printed by the author in 1761. In 1769 he was married, and his patron being made Lord-lieutenant of Ireland, he accompanied him to that kingdom. When Lord Halifax became secretary of state he procured nothing better for Cumberland than the clerkship of reports in the office of trade and plantations. In the course of the next two or three years he wrote an opera, entitled the Summer's Tale, and his comedy of The Brothers. His West Indian, which was brought out by Garrick in 1771, proved eminently successful. The Fashionable Lover not obtaining the success of the West Indian, he exhibited that soreness of character which exposed him to the satire of Sheridan in his sketch of Sir Fretful Plagiary, and which induced Garrick to call him the *man without a skin*. The Choleric Man, the Note of Hand, and the Battle of Hastings, were his next productions. On the accession of Lord George Germaine to office he was made secretary to the board of trade. In 1780 he was employed on a confidential mission to the courts of Lisbon and Madrid, which, owing to some dissatisfaction on the part of the ministry, involved him in great distress, as they withheld the reimbursement of his expenses to the amount of £5000, which rendered it necessary for him to dispose of the whole of his hereditary property. To add to his misfortune the board of trade was broken up, and he retired with a very inadequate pension, and devoted himself entirely to literature. The first works which he published after his return from Spain, were his entertaining Anecdotes of Spanish Painters, and the most distinguished of his collection of essays, entitled the Observer. To these may be added the novels of Arundel, Henry and John de Lancaster, the poem of Calvary, the Exodiad (in conjunction with Sir James Bland Burgess), and lastly, a poem called Retrospection, and the Memoirs of his own Life, which is the most valuable product of his pen. He also edited the London Review, in which the critics gave their names, and which soon expired. His latter days were chiefly spent in London, where he died May 7, 1811. The comic drama was his forte; and although he wrote much, even of comedy, that was very indifferent, the merit of the West Indian, the Fashionable Lover, the Jew, and the Wheel of Fortune, is of no common description. His Observer, since his acknowledgment of his obligations to Dr. Bentley's manuscripts, no longer supports his reputation as a Greek critic; his novels want that vivacity, sprightliness, and freshness which constitute the soul of fiction; and as a poet he was never more than a versifier.

CUMBERLAND, William Augustus, Duke of, second son of George II. of England; born in 1721, and died 1765. At the battle of Dettingen he was wounded when fighting at the side of his father. At Fontenoy, where he had the command of the allied army, he was compelled to yield to the superior experience of Marshal Saxe; but rose in reputation by subduing the insurrection in Scotland, caused by the landing of Charles Edward Stuart in 1745. He totally defeated the forces of the Pretender on Culloden Moor, but his success was owing more to the discord and irresolution prevailing in the camp of his brave antagonists, than from any distinguished talent exhibited by him. The duke obscured his fame by the cruel abuse which he made, or suffered his soldiers to make, of the victory. In 1747 Cumberland was defeated by Marshal Saxe at Lafeld. In 1757, when sent to protect his father's Hanoverian dominions against the inroads of the French, he lost the battle of Hastenbeck, against D'Estrées, and, Sept. 8, concluded the convention at Closter-Seven, by which 40,000 English soldiers were disarmed and disbanded, and Hanover placed at the mercy of the French. The duke was recalled, and Ferdinand, duke of Brunswick, received the command of the allied army.

CUMBERLAND MOUNTAINS, in Tennessee, form part of a range of the Appalachian system. The range commences in the south-west part of Pennsylvania, and in Virginia it takes the name of *Laurel Mountain*, passes through the south-east part of Kentucky, and terminates in Tennessee, 80 miles south-east of Nashville. The ridges rarely exceed 2000 feet in height. A considerable portion of this mountain range in Tennessee is composed of stupendous piles of craggy rocks. It is thinly covered with trees, and has springs impregnated with alum. Limestone is found on both sides of it.

CUMBRAE, or CUMBRAY, the GREATER and LESSER, two islands lying in the Firth of Clyde, betwixt the Isle of Bute and Ayrshire, and belonging to the county of Bute. The Greater Cumbrae is 2½ miles in length and 1½ in breadth; area, 5120 acres, of which about 3000 are arable. The only town upon it is Millport, a thriving place, with a good harbour. It is much resorted to by the inhabitants of Glasgow during the bathing season. The Lesser Cumbrae is about a mile in length by half a mile in breadth. A lighthouse is erected on the western side of it, in lat. 55° 46′ N.; lon. 4° 58′ W. Its light is stationary. Population of the Greater Cumbrae, 1600; of the Lesser, 11.

CUMBRIA, an ancient British principality, comprising, with part of Cumberland, the Scotch districts—Galloway, Kyle, Carrick, Cunningham, and Strathclyde. It was given to Malcolm, prince of Scotland, early in the eleventh century, to be held as a fief of the crown of England.

CUMBRIAN MOUNTAINS, a range of hills, England, occupying part of the counties of Cumberland, Westmoreland, and North Lancashire, extending from Fell Top, in Cumberland, to the slate quarries near Ulverston, in Lancashire, about 37 miles north to south, and 35 miles east to west. The mountains rise with steep acclivities, inclosing in some parts narrow but well-cultivated valleys, with numerous picturesque lakes, now rendered classical from their association with the names of Wordsworth, Southey, Coleridge, and Professor Wilson. Limestone, slate, and granite are found in several parts of these mountains.

CUMIN, OIL OF. Cumin, mentioned in the Bible and frequently referred to both by Greek and Latin authors, is an umbelliferous plant, which grows in Egypt and Ethiopia, and is largely cultivated in Sicily and Malta, whence it is brought to this country. The fruit, called cumin seeds, is of a light-brown colour, with an aromatic smell and caraway-like taste. It was formerly mentioned in the pharmacopœia, being the main constituent of *Emplastrum Cumini*, but this preparation is no longer official. Cumin seeds, when distilled with water, yield a pale-yellow limpid oil of disagreeable odour and harsh taste, which has been the subject of elaborate chemical investigation. It consists of two portions, an oil called *cuminol, hydride of cumyl*, or *cuminic aldehyde* ($C_{10}H_{12}O$), and *cymene* or *cymol* ($C_{10}H_{14}$). These also occur together in the oil from the seeds of water-hemlock, and oil of thyme, and can be prepared by various decompositions, but it is doubtful whether the bodies from the last-mentioned source are identical or only isomeric with the cumin-oil products. In one instance they certainly differ. Cuminol and cymol can only be partially separated by distillation, cymol being the more volatile, but cuminol is better removed by causing it to combine with hydropotassic sulphite. When pure, cuminol is a colourless liquid, lighter than water, boiling about 430° F. It has a strong odour of cumin and a burning taste. It yields numerous products, of which we can only mention the following:—Cuminic acid ($C_{10}H_{12}O_2$), by oxidizing agents, a white crystalline body, not soluble in water, which forms salts and nitro-substitution compounds. It is also obtained, along with cuminic or cymylic alcohol ($C_{10}H_{14}O$), by the action of alcoholic potash on cuminol. From cuminic acid is derived cumene (C_9H_{12}), a colourless fluid which exists naturally in Burmese naphtha, and is likewise found in some crude destructive distillation products. Cumene also yields a nitro-compound, from which cumidene is prepared. From cuminol is derived chlorocuminol ($C_{10}H_{12}Cl_2$), a heavy limpid oil, which behaves as if it were the bichloride of a hydrocarbon ($C_{10}H_{12}$), on which the name cumylene has been conferred. The other constituent, *cymol* ($C_{10}H_{14}$), is a colourless, strongly-refracting, lemon-smelling fluid, which has a sp. gr. of 0·85, and boils about 350° F. It is insoluble in water, but dissolves in alcohol, ether, oils, &c. It combines with chlorine and bromine direct, and with fuming sulphuric acid to form a conjugate acid, which with bases gives a set of crystalline salts termed *cymyl-sulphites*.

CUMMING, ROUALEYN GEORGE GORDON, commonly called the African Lion-hunter, a Scottish sportsman and writer, born 15th March, 1820, died at Fort Augustus, in Scotland, 24th March, 1866. He early acquired a taste for and experience in field-sports, particularly deer-stalking in the Highlands of Scotland. He entered the army and served some years in India, but finally retired from military service in 1843. From this time up till 1849 he made five hunting expeditions into various parts of South Africa, an account of which he published in 1850 in his Hunter's Life in South Africa. On his return to England he exhibited his collections in London in 1851, consisting of skins, tusks, and other trophies of the chase, by which he made a considerable profit, and caused a good deal of sensation. He claimed to have killed upwards of 100 elephants.

CUMULATIVE VOTE, the mode of voting adopted in the recent education acts for England and Scotland (Vict. 33 and 34, cap. lxxv., and 35 and 36, cap. lxii.) in the election of local school-boards. These acts provide that in every election for each school-board every voter shall be entitled to a number of votes equal to the number of members of the school-board to be elected, and may give all such votes to one candidate, or may distribute them among the candidates, as he thinks fit.

CUMYN, COMYN, or CUMMING, a family whose name appears frequently in the early history of England and Scotland. It had its possessions near the town of Comines, and from one of the branches sprang the historian Philip de Comines. The English Comyns came over with the Conquerer, and we find that Robert Comyn was sent by William with 700 men to reduce the northern provinces, a task which cost him his life. His nephew became chancellor of Scotland about 1133, and his nephew again inherited the English possessions of the family and acquired some lands in Scotland. He married Hexilda, countess of Athol, daughter of King Donald Bane, and had a son William who became Earl of Buchan by marrying the heiress of that powerful northern domain. By a former marriage this nobleman was father of Richard, the ancestor of the Lords of Badenoch, and of Walter, earl of Menteith. In the middle of the thirteenth century the family counted among its members four Scottish earls, one lord, and thirty-two belted knights. In the beginning of the fourteenth century it was almost annihilated by its rival competitor for the Scottish crown Robert Bruce, who slew the son of its head (the Lord of Badenoch) in Dumfries. The Earl of Buchan rose to revenge his kinsman, but was defeated by Bruce near Inverurie in 1308, and his earldom devastated with relentless cruelty. Such of the Cumyns as contrived to escape made their way to the English court, and by their talents secured considerable influence in the sister kingdom. Their blood is said to circulate through the numerous and royal descendants of King Henry IV. of England.

CUNDINAMARCA, a central department of New Granada. It comprehends the provinces of Bogota, Antioquia, Mariquita, and Neiva, with 291,000 inhabitants, whites, Indians, and mixed races nearly in equal proportions. The chief place is Santa Fe de Bogota.

CUNEIFORM WRITING. The word *cuneiform*, built up of two Latin words, *cuneus* a wedge, and *forma* a shape, is adopted to name that writing which is composed of wedge-shaped signs. The wedges are mostly of two sizes, the smaller being half the size of the larger, as in the example . Two or more wedges are grouped together in various combinations to form a sign , two wedges may be joined by their thin ends , or by their thick ends , and by such simple elements several systems of signs have been constructed for writing languages. Cuneiform writing is the most ancient known, and specimens of it on bricks made two thousand years before Christ are known to scholars, having been figured in the first vol. of the Cuneiform Inscriptions of Western Asia, edited by Sir Henry Rawlinson and Dr. Norris. Cuneiform writing has been called *arrow-headed* from its resemblance to arrows, and it has also been called *nail-headed*, for a similar reason, but the term *cuneiform* is now generally accepted.

The celebrated Behistun inscription is trilingual, the same record is engraved on the stone in three languages, of which the original is the Persian, which is translated into the Babylonian and the so-called Median The subject is a record of a portion of the history of Darius. Besides these three languages there is a fourth written in cuneiform characters, which has been designated Akkadian, and also Proto-Chaldæan. It has been named Akkadian from the city Akkad (see Gen. x. 10), and Proto-Chaldæan, as it was the primitive language of Chaldæa, or at least it preceded the Shemitic Babylonian, as the vernacular language of the country. The generally accepted name is Akkadian.

The Akkadian language, both spoken and written, is the most ancient, and was in use two thousand years before Christ. This language was written in cuneiform characters, which are mostly signs for distinct words, as is shown by the syllabary tablets. These tablets are made of clay, and formed part of the library of Assurbanipal, the Sardanapalus of the Greek historians. The following example will illustrate the scheme of the author of these tablets:—

The pronunciation of the Akkadian word expressed by Assyrian signs.	The Akkadian word.	The Assyrian translation of the Akkadian word.
nd	AD	A-bu = *Father*

The example is No. 92 of the syllabary, of which about a thousand are already printed. The syllabary is a part of an Akkadian and Assyrian dictionary, for teaching Assyrians the pronunciation and signification of the Akkadian language, and is certainly the most ancient dictionary known. Such a dictionary was probably a necessity for the Assyrians, for Akkadian words were much used in the Assyrian, and in the Babylonian down to the time of Darius. There are grammatical tablets also, containing inflections of Akkadian words explained by Assyrian, and examples of grammatical construction similarly explained. Thus, the value of the Akkadian signs, both for pronunciation and sense, is stated on Assyrian authority, and their use in Assyrian and Babylonian inscriptions during a period of 1500 years rests on both Assyrian and Babylonian authority.

The Akkadian cuneiform character is the most ancient, and is the source of the rest. The next in antiquity is the archaic Babylonian, chiefly found on bricks in the ruins of ancient cities in Babylonia; the complex arrangement of the wedges of these forms have been simplified in the course of ages down to the time of Nebuchadnezzar, but the arrangement is the same. The simplification may be compared to that of the Roman type from the black letter. There are no Assyrian inscriptions extant of the same age as those of the early kings of Babylonia, but the Assyrian characters have archaic forms also, which have given place to improved forms. The Assyrian and Babylonian forms are derived from a common source. Many of them are formed in different ways, and which appear to be unlike, but which, to the practised eye, are as like as our written hand is to Roman type.

The Assyrian and Babylonian are essentially the same language, and closely allied to the Hebrew, so that it belongs to the Shemitic family of tongues. The stem words of the Assyrian, like those of the Hebrew, are chiefly bisyllabic. Hebrew words are written from right to left by means of letters, three of which are required to write the consonants of the two syllables, and these are supplemented by signs called vowel points, some of which are written above the line of letters, some below, and some between them, to express the vowels of the two syllables. By this method of writing, the three consonants as a unity, are perceived at a glance. Assyrian is written from left to right by means of characters for syllables; thus the character represents both ab and ap; but ba is represented by , and pa by . There are three vowels in common use, viz. *a*, *i*, *u*, and a fourth in occasional use, *e*.

The consonants of the Assyrian correspond to those of the Hebrew alphabet, so that b and p represent ב and פ. The five Hebrew letters called *matres lectionis*, viz. א, ה, ו, י, and ע are represented in Assyrian by distinct signs, thus = א, = ה, and , and , = ו, = י, and = ע.

The following syllabary is elementary:—

ב (B) or פ (P)	ab, ib, ub,	ba, bi, bu.
פ (P) or ב (B)	ap, ip, up.	pa, pi, pu.
ג (G) or כ (K) or ק (Q).	ag, ig, ug.	ga, gi, gu.
כ (K) or ג (G) or ק (Q).	ak, ik, uk.	ka, ki, ku.

ק (Q) or כ (K) or ג (G).	aq, iq, uq.	qa, qi, qu.
ד (D) or ט (T) or ת (T)	ad, id, ud.	da, di, du.
ט (T) or ד (D) or ת (T).	aṭ, iṭ, uṭ.	ṭa, ṭi, ṭu.
ת (T) or ד (D) or ט (T).	at, it, ut.	ta, ti, tu.
ח (Ḥ)	aḥ, uḥ.	ḥa, ḥi, ḥu.
ס (Ṣ) or ז (Z) or צ (ts).	aṣ, iṣ, uṣ.	ṣa, ṣi, ṣu.
ז (Z) or ס (Ṣ) or צ (ts).	az, iz, uz.	za, zi, zu.
צ (ts) or ז (Z) or ס (Ṣ)	aẓ, iẓ, uẓ.	ẓa, ẓi, ẓu.
ל (L)	al, il, ul.	la, li, lu.
מ (M)	am, im, um.	ma, mi, mu.
נ (N)	an, in, un.	na, ni, nu.
ר (R)	ar, ir, ur.	ra, ri, ru.
ש (Sh)	ash, ish, ush.	sha, shi, shu.
	ash, ish.	sha, she, shu.

The application of this syllabary to writing the words of a language is cumbrous; for example, the Assyrian word *mat* can only be written ma-at. To obviate this, the Assyrians adopted a set of signs to express a vowel between two consonants, the sign for *mat* is . This greatly increased the number of signs, but it abbreviated the labour of writing. The syllabarium contains about four hundred characters, but some of the characters express more than one sound, thus the sign expresses the syllables lat and sat, as well as mat. This is a great difficulty in reading Assyrian cuneiform writing, but the difficulty is found to diminish as a knowledge of the language is gained, so that it could not have been great to an Assyrian. With the Assyrian it was a mere question of writing words well known to him—his mother tongue—but with us it is that of reading foreign words in a language but partially known to us. The Assyrian inscriptions were written to be read, and from our own experience, so far as we know Assyrian, they are easily read, and hence presented few difficulties to an Assyrian.

In addition to the phonetic expression of the language by the signs of the syllabarium, many words are habitually expressed by monograms, and exceptionally by phonetic signs, as—

God, but phonetically written i-lu. The monogram is pronounced *an* in the Akkadian language, but it signifies god. When the sign occurs in an Assyrian inscription, it may be a determinative to denote that the following word is the name of a god, as , the god Nebo; or something celestial, as , the Sun god, and Eclipse, *i.e.* celestial darkness.

Determinatives are much used in Assyrian, thus the sign before a word shows it to be a man's name, shows it to be a woman's name, is placed before the names of countries, before the names of cities, and there are many other determinatives.

We are familiar with the use of monogrammatic signs in English; for the numerals, 1, 2, 3, 4, 5, *et cet.*, are characters denoting ideas. They

are ideograms, or monograms. An Englishman reads them, one, two, three, *et cet.*, but a Frenchman reads them, un, deux, trois, *et cet.*, just as an Akkadian read the monogram *an*, while an Assyrian read it *ilu*, both meaning precisely the same thing, viz. *god*. But beyond this, we write the figure and a grammatical termination after it, 1*st*, 2*d*, 3*d*, *et cet.*, which we read first, second, third. And we add an adverbial ending, 1*stly*, 2*dly*, 3*dly*. These endings are complements to the theme expressed by the numeral. So that the writing is partly ideogrammatic and partly phonetic. There are but few ideograms in use in writing English, but a large number are found in Assyrian inscriptions, and most of them are accompanied by a phonetic complement. The Akkadian ideogram signifies both Day and Sun, when it signifies day, it is usually followed by the case ending, as its phonetic complement, thus *yommu*, Nom. case, *yommi*, Gen. case, and *yomma*, Accus. case; and when it signifies sun it is preceded by the determinative sign god, and followed by the case ending thus *shamshu*, Nom. case, *shamshi*, Gen. case, the author has not met with the accusative case of this noun.

Monograms for verbal roots are much in use combined with phonetic complements, thus the monogram is equated to *Halaku*, I went, which is the Heb. הָלַךְ to Walk. And on another tablet it is equated to *Aradupu*, I pursued, which is the Hebrew רָדַף to Pursue. There are several copies of the great inscription of Sardanapalus, and in some copies the verb, of which the T conjugation is adopted, is phonetically written *ittallaku*, He marched, while in other copies the monogram is adopted with the phonetic complement . But the verb in both cases was pronounced the same. In this example the Assyrian verb *ittallaku* is in an intensive conjugation corresponding to the Hebrew Piel, and to express this in the Akkadian monogram we find the monogram is repeated = ittallaku. The same verb occurs in Tiglath-Pileser VII. 40, where, instead of the repetition of the monogram, it is once written and followed by the plural sign thus = ittallaku.

Such are the leading peculiarities adopted by the Assyrian and Babylonians in writing their languages in cuneiform characters.

The Persian cuneiform writing dates from the time of Darius, and the chief inscription in it is that at Behistun. Its alphabet consists of about forty characters, which were adopted with special reference to the writing of Persian sounds. It is a real alphabet and not a syllabary, although some syllables are represented by single characters. None of the signs are polyphonous, that is to say, each sign is always of the same phonetic value. There are no ideograms in it. The Persians adopted the idea of cuneiform signs from the Babylonians, but they invented a far simpler set of signs, which they ably applied to write the language. Sir H. Rawlinson arranges the Persian cuneiform alphabet on the model of the Sanskrit. It is unnecessary to insert the alphabet, but the signs for the three vowels which may be compared with the Assyrian are a, i, and u. The direction of the writing is from left to right. All the inscriptions are cut on stone, and hence called *lapidary*.

The Persian inscription at Behistun has also been translated into a language which has been named Median, and Scythic, but these are only provisional names. It is not yet certain what modern language represents it, but Mr. Norris in his able memoir has proved that it bears some analogies, if not affinities, to the Ugrian languages, of which the Suomi, the language of Finland, is the leading type. 'Many of the characters,' Mr. Norris remarks, 'resemble those of the Babylonian alphabet, and it is probable that the more civilized Babylonians adapted their cumbrous mode of writing to the language of the uncivilized Scythians, in the same way as we employ the Roman alphabet for the languages of Africans and Polynesians, using only such characters as are wanted in the new language. The Babylonians thus were able to effect their object by one-third of the characters which they used in writing their own language, discarding a very superfluous amount of homophones and ideographs which had been either the result of a transition from hieroglyphs or picture writing, or else were invented for the purpose of concealment, and of retaining the art of writing in the hands of a privileged few.' (Scythic Version of the Behistun Inscription, p. 6).

The name of Darius is cut on the Behistun rock in three languages, each of which has its own system of cuneiform writing. The English orthography of the name has come to us through the Greek Δαρειος as written by Herodotus, the Latin form of which, Darius, is adopted in the Bible and our secular literature. The Greek orthography but ill represents the Persian, which is, however, well represented by the Hebrew and Chaldee, which is evidently a good transliteration of the Persian. The word דָּרְיָוֶשׁ, pronounced Daryawesh, well represents the cuneiform as written by Persians in the lifetime of that monarch, and so well preserved on the Behistun rock.

PERSIAN.

Da - a - r - y - w - u - sh.

The Babylonian and Median forms are subjoined—

BABYLONIAN.

Da - ri - ya - us.

MEDIAN.

Da - ri - ya - wa - u - us.

It will be seen that the first three characters of the Median are but slight variations of the first three of the Babylonian.

The cuneiform inscriptions of Susa, the Shushan of the Book of Esther, are not yet decyphered.

CUNERSDORF. See KUNERSDORF.

CUNNINGHAM, the northern district of Ayrshire, and the most fertile, in which are situated several populous towns and villages, such as Irvine, Ardrossan, Beith, &c., which see.

CUNNINGHAM, ALLAN, born in 1785, at Blackwood, in Dumfriesshire, of parents who, though in humble circumstances, claimed to be descended of ancestors who lost their estates by adhering to Montrose during the civil war, was apprenticed in his eleventh year to a stone-mason. While thus employed he courted the muses in his leisure hours, and having become acquainted with Cromek, was employed by him to collect materials for his Remains of Nithsdale and Galloway Song. Instead of collecting, he sent his own productions as genuine fragments of ancient minstrelsy. Cromek, not suspecting the deception, included them among his Remains published in 1810. The truth, however, could not be concealed. Bishop Percy, while admitting their excellence, at once declared against their genuineness, and the discovery of the real author quickly established his literary fame. The same year in which they were published he proceeded to London, where he at first supported himself by reporting for the newspapers and contributing to periodicals. At last he succeeded in obtaining a situation in the studio of Sir Francis Chantrey, and continued to hold it during the remainder of his life. He never ceased, however, to prosecute his literary labours with unabated vigour, and produced in succession the drama of Sir Marmaduke Maxwell, the novels of Paul Jones and Sir Michael Scott, and the Songs of Scotland. In 1829 appeared his British Painters, Sculptors, and Architects, which met with great success, and is considered by some his best work. It is certainly one of the most amusing, though its accuracy has been called in question. Among his other works which have acquired some degree of celebrity are his Life of Burns and Life of Mary Queen of Scots. He died at London in 1842. His poetical talents are displayed to greatest advantage in his songs, which are distinguished by natural feeling, sweetness, and beauty, both of thought and expression. His It's Hame and it's Hame, and A Wet Sheet and a Flowing Sea, are pronounced by Sir Walter Scott to be worthy of Burns, and equal to the best songs of their time. On the whole, however, his poetry derives much of its interest from national allusions, and is hence more admired by his own countrymen than by foreigners.—His son PETER (born at Pimlico in 1816) was also a littérateur of some note. He was placed at an early age in the public service, from which he retired in 1860. His principal works are The Story of Nell Gwynne, Life of Drummond of Hawthornden, Modern London, Life of Inigo Jones, Handbook to Westminster Abbey, &c. He also edited and re-edited several books of repute, such as Walpole's Letters, Goldsmith's Works, and the Songs of England and Scotland. He has, in addition, contributed to many of the leading periodicals and magazines: Fraser's Magazine, Household Words, the Athenæum, the Illustrated News, &c. His death took place on the 18th April, 1869.

CUPAR, or CUPAR-FIFE, a town in Fifeshire, the capital of the county, finely situated on the river Eden, at the distance of 10 miles west from St. Andrews, and 27 north from Edinburgh. Though of high antiquity, its appearance is that of a modern thriving town, being well built, paved, and lighted, and containing several elegant public edifices. It manufactures some linen, leather, ropes, and bricks. The knights templars had great possessions here; and at the foot of Castle Hill there was a convent of Dominican friars, with an elegant chapel, founded by the Macduffs; near which is a place termed the Playfield, where theatrical pieces, called mysteries, were formerly exhibited. Here, too, was performed the Three Estates, a satire on the priesthood, which hastened the religious revolution, and was written by Sir David Lindsay of the Mount (a property situated in the neighbourhood). In the environs a treaty was concluded in 1559 between the partisans of the queen-regent and those of the Congregation. Pop. 5105.

CUPAR-ANGUS. See COUPAR-ANGUS.

CUPEL, a shallow earthen vessel, somewhat resembling a cup, from which it derives its name. It is formed of bone ashes, and is extremely porous. It is used in assays, to separate the precious metals from their alloys. The process of *cupellation* consists in fusing an alloy of a precious metal, along with a quantity of lead, in a cupel. The lead is extremely susceptible of oxidation, and at the same time it promotes the oxidation of other metals, and vitrifies with their oxides. The foreign metals are thus removed; the vitrified matter is absorbed by the cupel, or is driven off by the blast of the bellows as it collects on the surface; and the precious metal at length remains pure. Cupellation is clearly referred to several times in the Old Testament, and the cupel is described in terms almost identical with those of the present time in one of the oldest extant medieval works on chemistry.

CUPID, a celebrated deity among the Romans; the god of love, and love itself, a modification of the Greek Erōs, and borrowed from Greece. Cupid is represented as a winged infant, naked, armed with a bow, and a quiver full of arrows. On gems and all other antiques he is represented as amusing himself with some childish diversion. Sometimes he appears driving a hoop, throwing a quoit, playing with a nymph, catching a butterfly, or with a lighted torch in his hand. At other times he plays upon a horn before his mother, or closely embraces a swan, or, with one foot raised in the air, he, in a musing posture, seems to meditate some trick. Sometimes, like a conqueror, he marches triumphantly, with a helmet on his head, a spear on his shoulder, and a buckler on his arm, intimating that even Mars himself owns the superiority of love. His power was generally shown by his riding on the back of a lion, or on a dolphin, or breaking to pieces the thunderbolts of Jupiter. See AMOR.

CUPOLA, in architecture. The Italian word *cupola* signifies a hemispherical roof, which covers a circular building, like the Pantheon at Rome, and the Round Temple at Tivoli. Many of the ancient Roman temples were circular; and the most natural form of a roof for such a building was that of a half globe, or a cup reversed. The invention, or at least the first use, of the cupola belongs to the Romans; and it has never been used with greater effect than by them. The greater part of modern cupolas (unlike those of the ancients, which are mostly hemispherical) are semi-elliptical, cut through their shortest diameter. The ancients seldom had any other opening than a large circle in the centre, called the *eye* of the cupola; while the moderns elevate lanterns on their top, and perforate them with dormer windows, and other disfigurements. The ancients constructed their cupolas of stone; the moderns, of timber, covered with lead or copper, and frequently of glass, in which cases they serve to admit the light for the whole building. Of cupolas, the finest, without any comparison, ancient or modern, is that of the Rotundo or Pantheon at Rome (142½ feet internal diameter, and 143 feet internal height), erected under Augustus, and still perfect. Of modern construction, some of the handsomest are that of St. Peter's at Rome (139 × 330 feet), those of St.

Paul's, London (112 × 215 feet), the Hotel des Invalides (80 × 173 feet), and the church of St. Geneviève at Paris (67 × 190 feet), Santa Maria da Fiori at Florence (139 × 310 feet), and St. Sophia at Constantinople (104 × 201 feet). The figures represent the internal diameter and height in English feet.

CUPPING, the application of the cucurbita or cupping-glass, an operation employed where it is desirable to abstract blood from, or draw it to, a particular part. There are two kinds of cupping: one by which some blood is taken away, generally simply termed *cupping;* the other when no blood is abstracted, which is accordingly termed *dry-cupping.* In both cases the cupping-glass is first held over the flame of a spirit-lamp, by which means the included air is rarefied. In this state it is applied to the skin, and as the heated air cools, it contracts and produces a partial vacuum, so that the skin and integuments are drawn up into the glass, and become swollen. If blood is then wished to be drawn, an instrument called a *scarificator* is used. This consists of a square box of brass, containing from ten to twelve lancets, which are set and discharged by a spring; the depth of the incision can be exactly regulated, and the action is so instantaneous that very little pain is felt.

CUR, the name loosely given to any worthless dog of mongrel breed, but applied more strictly to a cross between the sheep-dog and terrier. This dog is remarkable for its activity, honesty, and intelligence, but also notorious for its noisy tongue and disposition to turn tail to a serious opponent.

CURAÇAO, an island, Dutch West Indies, Caribbean Sea, 46 miles N. the coast of Venezuela, between lat. 12° 3′ and 12° 24′ N., and lon. 68° 47′ and 69° 16′ W., stretching N.W. to S.E.; 36 miles long and 8 miles broad; capital Wilhelmstad. It rises wild, bare, and abrupt, and consists of two ridges of greenstone, connected by a limestone dyke 1½ mile thick. Iron and copper occur, but are not wrought. Both soil and atmosphere are dry, and the heat tempered by the sea breezes; yet yellow fever reappears every sixth or seventh year. The inhabitants often suffer from long and severe droughts. The opuntia, among other cactuses, grows on the island; yet cochineal has been cultivated carefully only of late. The tamarind adorns the gardens; the cocoa-palm, banana, and several other useful trees, are reared—among which are three varieties of the orange—and the lime, from which the far-famed Curaçao liqueur is made. Sea-parsley abounds, also water-melons, pumpkins, cucumbers, and various other vegetables. The small proprietors live mainly by rearing horses, asses, horned cattle, sheep, and goats—all originally from Europe or Barbary; but heavy losses are often sustained in herds and flocks from drought. The horses, which are small, but fleet and vigorous, are used only for riding—oxen and cows being employed for draught. Sea and land turtle, including a few of the tortoise-shell species, abound; together with land birds, sea-fowl, and insects, including three kinds of scorpion and very large centipedes. The shores teem with magnificent lobsters, crabs, and shell-fish; and the seas furnish plenty of excellent fish. The staple of the island, however, is salt, obtained by natural evaporation, and of the finest quality. Large quantities of it are exported. Other exports are cochineal and cattle. The islands of Curaçao, Bonaire, Oruba (or Aruba), and Little Curaçao, form a Dutch government, the residence of the governor being at Wilhelmstad. Curaçao was settled by the Spaniards early in the sixteenth century; it was taken in 1632 by the Dutch; and was captured by the British in 1798, but restored at the Peace of Amiens. It was taken again by the British in 1806, and finally ceded to Holland at the general peace in 1814. Pop. 20,702; including the dependencies, 34,818.

CURAÇAO, or CURAÇOA. The genuine Dutch liqueur of this name, so much esteemed for its taste and aroma, is prepared from a peculiar kind of bitter oranges growing in Curaçao, which fall from the tree before they are ripe, and which have an extremely persistent aromatic odour and taste. The rind of the orange is macerated, the white pulpy matter scraped off, and the yellow part, along with yellow fresh oranges, steeped in strong alcohol for four-and-twenty hours. The liquor is distilled and rectified, about a half being collected, and this is mixed with a syrup made of fine white sugar. To this is added a certain quantity of curaçao infusion, which is a stronger alcoholic extract of the peel containing sugar, and then a certain proportion of water. The fluid is clarified and allowed to settle. The finest quality has a deep yellow colour, which is sometimes improved by a few drops of tartaric acid. Many recipes are given, and various qualities of the liqueur are the result. For the true orange, the common bitter orange of Europe is often substituted, and the colour is frequently due to caramel, to Brazil-wood, or to logwood, the tint required being produced by the addition of tartaric acid, cream of tartar, potassic carbonate, and alum.

CURAÇOA ORANGES (*Aurantia curassaventia*), or small oranges fallen from the tree long before their maturity, have properties similar to those of the orange peel: they are, however, more bitter and acrid. They are used in the United States and in England for the same purposes as the orange peel, and also as issue peas.

CURARA, URARA, WOORALI, the well-known arrow-poison of the Indians in Spanish Guiana, and in Northern Brazil, has been much described, but is still surrounded with obscurity. It is the aqueous extract of a tree, generally said to be a kind of Strychnos, though that has been doubted by recent investigators, thickened with mucilaginous matter. It is brought to Europe in calabashes as a brown powder, which dissolves in water with a red colour, acid reaction, and bitter taste, and gives no precipitate with alkalies. Others say it is a black, shining, resinous mass, which dissolves in water and aqueous alcohol, and evolves a nitrogenous odour when heated. It contains an active principle, fatty, resinous, and red colouring matters, and some ash. When a small quantity of this substance is introduced into the system by a scratch in the skin, death rapidly follows. South American travellers have given conflicting accounts both of the preparation and action of the poison, but they all agree in the statement that the flesh of an animal killed by a curarized arrow is quite wholesome, as the poison has no effect when swallowed.

The active principle was first isolated in an impure uncrystallizable state about 1830, by Boussingault and Roulin; it was afterwards examined by other chemists, but it was first got crystallized by Preyer in 1865. By extracting curara with alcohol, distilling away the alcohol, dissolving the residue in water, adding corrosive sublimate and decomposing the compound formed, hydrochloride of curarin was obtained. Curarin itself crystallizes in colourless four-sided prisms, which have a bitter taste, are very hygroscopic, and dissolve readily in alcohol and water, the solution being alkaline, but not in ether or benzol, and sparingly in chloroform. The formula assigned to the base is $C_{10}H_{12}N$. It forms salts with the mineral acids, which crystallize, but are very soluble in water.

Many experiments have been made to determine the action of this poison, and it now seems certain that it paralyzes the nerves of motion, and that an animal under its action dies of suffocation from para-

lysis of the muscles of the chest. The minutest quantities of the pure base produce toxic, or even fatal symptoms, 0·015 grain being fatal to a rabbit, and 0·004 to a frog, when injected under the skin. It has been employed in medicine, for example, as a counteragent to strychnine, but its action seems to be uncertain, for in some cases it has been highly successful, while in others it has failed. Curarine which has been taken into the stomach seems to be eliminated almost entirely unchanged. If after administration of curarine life be maintained by artificial respiration, symptoms of *diabetes mellitus* are perceived, and the urine contains sugar.

CURASSOW, or Hocco (*Crax*), a large gallinaceous bird (family *Cracidæ*) which inhabits the thickly-wooded districts of Guiana, Mexico, and Brazil. It is a handsome bird, nearly as large as the turkey, and more imposing in form and colour. It is gregarious in its habits, and is susceptible of domestication, and, to all appearance, may be as easily acclimatized in this country as the turkey or pheasant. Its flesh is peculiarly white and well-flavoured, surpassing even that of the turkey, and it is of a pleasant temper, is readily tamed by kindness, and not so noisy a bird as many of our domestic poultry. The curassows build among the trees, making a large and rather clumsy nest of sticks, leaves, and grass. There are generally six or seven eggs, not unlike those of the common hen, but larger and thicker shelled. The crested curassow is of a dark violet colour, with a purplish-green gloss above and on the breast, and the abdomen is the purest snowy white. The bright golden crest adds in no small degree to the beauty of the bird.

CURATE (Latin, *curare*, to take care), properly an incumbent who has the care of souls; now generally restricted to signify the substitute or assistant of the actual incumbent. *Perpetual* curacies are those where there is neither rector nor vicar; but the tithes having been appropriated, the lay appropriator is obliged to appoint a curate at a stipend. In large parishes it is usual to appoint more than one curate, to officiate in the parish church and assist the incumbent in his duties. There are also curates in chapels of ease, and in the modern foundations known as district churches, which belong to ecclesiastical subdivisions within parishes, and subordinate to the rector or vicar in some matters, but independent in others. By act 1 and 2 Vict. the lowest stipend to be paid to a curate is £80, the sum rising, in proportion to the population of the cure, to £150 as a maximum—a scale of pay miserably inadequate to meet the legitimate wants of a man of culture and education.

CURATOR (Latin) in a general sense signifies a person who is appointed to take care of anything. In the civil law it signifies the guardian of a minor who has attained the age of fourteen. Before that time minors are under a tutor. The guardianship of persons under various disabilities, and of the estate of deceased or absent persons and insolvents, is also committed to a curator. In learned institutions the person who has charge of the library or collections of natural history, &c., is often called a curator.

CURCUMA. See Turmeric.

CURD. See Milk.

CURDS. See Kurdistan.

CURETES. See Corybantes.

CURFEW (French, *couvre-feu*, cover fire), the ringing of a bell or bells at night as a signal to the inhabitants to rake up their fires and retire to rest. This practice originated in England from an order of William the Conqueror, who directed that at the ringing of the bell at eight o'clock all fires and lights should be extinguished. His motive was to prevent the assembling of the Anglo-Saxons under cloud of night to conspire against his authority. The law was repealed by Henry I. in 1100, but the practice of ringing the bell at a certain hour of the evening continued, and is still prevalent in many places.

CURIA, the name given to certain divisions of the Roman people, which Romulus is said to have established, and also to the place of assembly for each of these divisions. According to Livy, Romulus divided Rome into thirty *curiæ*, and assigned to each a separate place, where they might celebrate their feasts under their particular priest, who was called *curio*. At the *comitia curiata* the people assembled in curiæ to vote on important matters. To vote *curiatim*, therefore, is to vote by curiæ. In early times only the members of the curiæ were in possession of the full citizenship, and the comitia curiata was the only legitimate representative assembly of the whole people.

CURIA, Papal, is a collective appellation of all the authorities in Rome, through which are exercised the rights and privileges the pope enjoys as first bishop, superintendent, and pastor of Roman Catholic Christendom. The right to grant or confirm ecclesiastical appointments is exercised by the *dataria*. This body receives petitions, draws up answers, and collects the revenues of the pope for the *pallia*, *spolia*, benefices, *annates*, &c. It is a lucrative branch of the Papal government, and part of the receipts go to the apostolic chamber. There is more difficulty attending the business of the *rota*, the high court of appeal. In former times the cardinal grand penitentiary, as president of the *penitenzieria*, had a very great influence. He issues all dispensations and absolutions in respect to vows, penances, fasts, &c., in regard to which the pope has reserved to himself the dispensing power; also with respect to marriages within the degrees prohibited to Catholics. The drawing up of bulls, answers, and decrees, which are issued by the pope himself or by these authorities, is done by the Papal chancery, consisting of a vice-chancellor and twelve *abbreviatori*, assisted by several hundred secretaries; the *breves* only are excepted, and are drawn up by a particular cardinal. All these offices are filled by clergymen. The highest council of the pope, corresponding in some measure to the privy-council of a monarch, is the college of the cardinals, convened whenever the pope thinks fit. The sessions of this senate, which presides over all the other authorities in Rome, are called *consistories*. They are of different kinds. The secret consistory is held generally twice a month, after the pope has given private audience to every cardinal. In these sessions bishops are elected, *pallia* granted, ecclesiastical and political affairs of importance transacted, and resolutions adopted on the reports of the congregations delegated by the consistory: beatifications and canonizations also originate in this body. Different from the secret consistories are the semi-secret ones, whose deliberations relate principally to political affairs, and the results of them are communicated to the ambassadors of foreign powers. The public consistories are seldom held, and are principally ceremonial assemblies: in these the pope receives ambassadors, and makes known important resolutions, canonizations, establishments of orders, &c. According to rule all cardinals residing in Rome should take part in the consistories; but in point of fact no one appears without being especially summoned by the pope. The pope, if able to do so, always presides in person, and the cardinal secretary of state is always present, as are likewise the cardinals presidents of the authorities.

CURIATII. See Horatii.

CURISCHES. See Kurisches Haff.

CURLEW (*Numenius*, Briss.), a genus of birds belonging to the order *Grallatores*, or Waders, and family *Limicolæ*, whose most remarkable characteristic is that the bill is wholly or partially covered by a soft, sensitive skin, which enables them to obtain their food from the mud with facility, though unable to discover it by sight. The genus is characterized by a very long, slender, almost cylindrical, compressed, and arcuated bill, having the upper mandible longer than the lower, furrowed for three-fourths of its length, and dilated and rounded towards the tip. The nostrils are situated in the furrow, at the base, and are lateral, longitudinal, and oblong. The tongue is very short and acute. The feet are rather long, slender, and four-toed; the tarsus is one-half longer than the middle toe. The four toes are connected at the base by a short membrane to the first joint. The nails are compressed, curved, acute, and the cutting edge of the middle one is entire. The first primary is the longest; the tail, which is somewhat rounded, consists of twelve feathers. Two species of curlew inhabit the British Isles, the curlew proper, called in Scotland the 'whaup' (*Numenius arquata*), and the whimbrel (*N. phæopus*). They are both very similar in appearance and in habits, only the latter is rather smaller than the former, being about 17 inches long, while the curlew is about 2 feet. The plumage of the curlew is generally dull, being grayish-brown, rusty-white, and blackish, in both sexes, which are similar in size. The young bird also differs very little from the parents, except that the bill is much shorter and straighter. Their favourite resorts are generally in winter near the sea-shore or in marshy and muddy places in the vicinity of water, over which they run with great quickness, but in summer on extensive heaths or in mountainous districts. They feed on various worms, small fishes, insects, and molluscous animals, and are very shy, wary, and vigilant of the approach of man. They are monogamous, and pass most of their time separate from the rest of their species. Their nests are built on tufts or tussocks in the marshes or on the moors, and during incubation both parents assiduously devote themselves to their charge. The eggs are usually four, being much larger at one end than the other, or pyriform in shape. The young as soon as hatched leave the nest to seek their own subsistence. At the period of migration the curlews unite to form large flocks, and their flight is high, rapid, and protracted. They utter a loud, whistling note, easily recognized when once heard, but not easy to be characterized by description. The curlew is good eating. It usually flies low, and thus offers a bad mark to the sportsman. Three species of curlew are inhabitants of America—the long-billed curlew (*N. longirostris*, Wils.), which is about 29 inches long, with a bill 7 to 9 inches in length; the Hudsonian, or short-billed curlew (*N. Hudsonicus*, Lath.); and the Esquimaux curlew (*N. borealis*, Lath.)

CURLING (Teutonic, *krullen*, or French, *crouler*), a favourite Scottish winter amusement on the ice, in which contending parties slide large smooth stones of a hemispherical form, of from 30 to 45 lbs. each, with an iron or wooden handle at the top, from one mark to another. The space within which the stones move is called the *rink*, and the hole or mark at each end the *tee*. The length of the rink from tee to tee varies from 30 to 50 yards. The players are arranged in two parties, each headed by a *skip* or director. The number of players upon a rink is eight or sixteen—eight when the players use two stones each, and sixteen when they use one stone each. There may be one or more rinks according to the number of curlers. The object of the player is to lay his stone as near to the mark as possible, to guard that of his partner which has been well laid before, or to strike off that of his antagonist. When the stones on both sides have been all played the stone nearest the tee counts one, and if the second, third, fourth, &c., belong to the same side, each counts one more, the number played for being generally thirty-one. From the south of Scotland, where the game was formerly most popular, it has travelled into England, Canada, and every other country where Scotchmen can find ice of sufficient firmness. At the *bonspiels* or set matches may be often seen the parish minister, the laird, the wealthy farmer, the ploughman, and the daily labourer cordially uniting in the same game, and adjourning to the same table to partake of the curlers' supper, beef and greens.

CURRAH, a town, Hindustan, in the province and 40 miles north-west of Allahabad, on the south-west side of the Ganges. It is now ruinous, but was once a place of great importance, and is celebrated for a great battle fought in its vicinity between the Hindus and their Mohammedan conquerors.

CURRAN, JOHN PHILPOT, a celebrated Irish advocate, was born at Newmarket, near Cork, in 1750. He was educated at Trinity College, Dublin, after which he repaired to London and studied at one of the inns of court. In due time he was called to the bar, shortly after which he married Miss O'Dell, an Irish lady of a very respectable family. By the influence of his talents he gradually rose to great reputation; and during the administration of the Duke of Portland he obtained a silk gown. In 1784 he was chosen a member of the Irish House of Commons. His abilities now displayed themselves to advantage, and he became the most popular advocate of his age and country. During the distracted state of Ireland, towards the close of the last century, it was often his lot to defend persons accused of political offences, when Mr. Fitzgibbon (afterwards Lord Clare), then attorney-general, was his opponent. The professional rivalry of these gentlemen degenerated into personal rancour, which at length occasioned a duel, the result of which was not fatal to either party. On a change of ministry during the vice-royalty of the Duke of Bedford Mr. Curran's patriotism was rewarded with the office of master of the rolls. This situation he held till 1814, when he resigned it, and obtained a pension of £3000 a year. With this he retired to England, and resided chiefly in the neighbourhood of London. He died in consequence of a paralytic attack at Brompton, 14th Oct. 1817, at the age of sixty-seven.

Curran possessed talents of the highest order: his wit, his drollery, his eloquence, his pathos, were irresistible; and the splendid and daring style of his oratory formed a striking contrast with his personal appearance, which was mean and diminutive. As a companion he could be extremely agreeable; and his conversation was often highly fascinating. In his domestic relations he was very unfortunate; and he seems to have laid himself open to censure. The infidelity of his wife, which was established by a legal verdict, is said to have been a subject on which he chose to display his wit, in a manner that betrayed a strange insensibility to one of the sharpest miseries which a man can suffer. On the other hand, he would not touch the damages obtained from the seducer; he even allowed the faithless wife a stipend, and went to London to see her when she supposed she was at the point of death. Mr. Curran appears never to have committed anything to the press, but he is said to have produced some poetical pieces of considerable merit. A collection of his forensic speeches was published 1805 (one vol. 8vo). Memoirs of his life have been published by his son, by Mr. Charles Phillips, and by Mr. O'Regan.

CURRANTS. Red and black currants are the fruit of well-known shrubs, which are cultivated in gardens, and which also grow wild in woods or thickets in various parts of Europe and America. In domestic economy they are extensively used in the manufacture of preserves and wine. The white currant, which is a mere variety of the red, the result of cultivation, having the most delicate flavour, is in most request for the dessert. The red is principally used in the preparation of jellies, and the white is converted into wine. The black currant is a native of most of the parts of Europe, and is found abundantly in the woods of Russia and Siberia. They answer well for tarts or puddings, and can be made into a fine jelly, which in village pharmacy is recommended in cases of sore throat. The dried currants of the shops do not belong to this family, but are a small kind of grape, largely cultivated in Zante, Cephalonia, and Ithaca, of which islands they form the staple produce; and in the Morea, in the vicinity of Patras. The plant is delicate, and as a plantation must be six or seven years old before it can produce its cultivation requires a great outlay of capital. The crop is particularly liable to injury from rains in the harvest, and is altogether of a very precarious description. After being dried in the sun the currants are exported packed in large butts. Over 1,000,000 cwts. of currants are yearly imported into Britain alone, the greater part of which is retained for home consumption.

CURRANT WINE is made of the juice of the white or red currant, to which is added about a pint of water for every four pints of berries employed. A pound and a half of sugar is afterwards added to each pint, and a little spirits mixed before the liquor is set aside to ferment. If a stronger wine is wanted more sugar is employed and no water. Fermentation requires several weeks, and the wine is not fit for use for some months afterwards. Black currant wine is made in somewhat the same way, only the berries are first put over the fire and heated to the boiling-point in as small a quantity of water as possible. The wine obtained from good white currants, if properly made, may challenge comparison with some of the grape wines.

CURRENCY. In every civilized community there exists some medium of exchange called a currency. In most, if not all, such countries commercial exchanges are subject to certain restrictive laws which bear especially on what may be called the universal media of exchange, whether these consist of commodities in universal estimation or merely in promises to pay. These restrictive laws, which may in general be called currency laws, in addition to any natural laws to which such exchanges may be subject, condition in each country where they prevail, the nature, extent, and operation of the currency of that country. The operation of a currency being commonly looked at through the medium of its latest developments, the various views taken of it give rise to many theories both as to the propriety or impropriety of restrictions, and as to the kind and nature of the restrictions to which a currency should be subjected. It will remove many of these grounds of controversy, and enable the reader to take a clearer view of others, if we begin with a survey, not of the latest development of a currency, but of its origin and natural conditions. A currency is a spontaneous growth of commerce, and one of the earliest developments of the principle of exchange. Originally all exchanges may be supposed to be founded on the simple principle of barter, all commodities bearing a like relation to each other, and being exchanged simply according to the convenience of the particular holders. But in the actual course of exchange two distinctions could not fail speedily to arise. Some commodities, from their primary and invariable utility, would exchange more freely than others; and some exchanges, otherwise desirable, would be effected with difficulty and often frustrated, from the inconvenience of transporting the commodities to be exchanged. Hence in the natural and unconcerted exercise of individual judgment certain commodities would be recognized as a desirable means of accumulating wealth for future exchanges, and at the same time certain desirable exchanges would have to be effected by indirect means. The simplest indirect exchange may be called a triangular one. A and B have each a commodity which they wish to exchange, but distance and the nature of one of the commodities prevents the exchange from taking place. In looking round for some means of effecting his object, A, who holds the non-transferable commodity, finds C, who has also a commodity he is willing to exchange for his, but which A does not want. He mentions the matter to B, who is willing to take C's article in exchange for his own. The transportation of the commodities of B and C brings B's commodity to a place where it can be conveniently exchanged for A's, and the triangular exchange may now take place. A triangular exchange may often be promoted or conveniently effected by writing. C may send off his commodity to B on getting a promise from B to send his on receiving it, or at some future specified opportunity; and to save a double transport, he may direct B to send the commodity to A, taking A's promise to deliver his own on receiving it. The exchange thus assumes the initial form of a banking transaction. C takes the promise of B endorsed by A in place of a commodity, and this written promise constitutes a sort of currency or medium of exchange, founded on the credit of A and B, which not only affords the means of carrying out the original transaction, but which C may transfer to some one else, and thus make the basis of a new transaction.

We have thus, from the very nature of exchange, two distinct forms of currency arising out of the very earliest commercial transactions: namely, commodities possessing special advantages for facilitating exchange, and engagements entered into by actual or anticipated holders of commodities and reduced to writing. The commodities first used as a currency would probably be those in most constant request for the supply of common and primary wants, articles of food and clothing, as these would present in the highest degree the first great requisite of a currency, exchangeableness. Those commodities which are commonly called staples would thus naturally constitute the primary form of currency, and such articles are occasionally found to be used in this way still. Corn and cattle would hold a prominent place among those early media of exchange; the former especially among near neighbours; the latter, owing to their powers of self-transportation, over a much wider range. In early records we find commodities frequently valued in sheep, in oxen, or in horses.

As transactions became numerous great inconveniences would be found in these early media. They would be found deficient in divisibility and transportability, and a still more radical defect in their fulfilment of the essential qualities of a currency would be found in the great fluctuations of value to which they are liable. The demand for such articles is constant, but it is limited in a general way by the number of those whose wants are to be supplied. The supply of them depends on a combination of conditions created by the joint operation of human industry and natural causes, which are so uncertain, especially where free communication between distant

places is wanting, that it fluctuates between extreme plenty and extreme scarcity. When a medium of exchange is of uncertain value, exchanges will be hindered, and will be subject to the double disadvantage of being unduly favourable to the one party and unduly adverse to the other, and the even course of industry, the only true source of prosperity, will be disturbed equally by successes which have not been merited, and by disasters which could not be anticipated. Thus it would soon be found that no quality was more desirable, and indeed indispensable, in a currency than steadiness of value, or a constant relation between supply and demand. This quality, which is wholly wanting in articles of the most common consumption, is found in an admirable degree in another class of articles which minister not to the absolute necessities, but rather to the conveniences, and even to the luxuries of life. Chief among this class of commodities are the metals, particularly those which for this very reasop have acquired the name of the precious metals. The special characteristic which renders the precious metals so peculiarly adapted to the purposes of a currency is that while the demand for them is only inferior in universality to that for articles of the first necessity, it is so regulated as to maintain, comparatively with other commodities, a tolerably constant relation to the supply. These articles do not minister to absolute necessities they can never consequently be at a famine price. The wants they supply include some actual uses and conveniences, and many more which depend on sentiment. These metals are capable of being used for many purposes of ornament and show, and there is in human nature a universal desire for such distinctions, which rises in some measure with the difficulty of attaining them. While the desire for these metals is thus sufficiently strong and universal to make them a fit subject for a currency, the supply is not easily affected by circumstances out of a regular and calculable course. As they are not easily lost or destroyed, the stock of them is less liable to diminution than that of most other commodities. The supply is thus more liable to be increased than diminished, but as the quantity to be found of them is limited, it can only be increased slowly, and in the proportion of the application of a special labour; the field of demand has also, as long as commerce advances, a constantly expanding area, so that the supply and the demand move in the same direction. There is yet another circumstance which tends to maintain an equilibrium between the supply and the demand for these commodities when used as a currency. This use of them bears on the supply of necessaries; their other uses bear only on the supply of conveniences and luxuries. Hence when at any particular time or place the supply of these metals is abundant, they will be more freely used as luxuries, and the increased demand will tend to maintain their value; when they are scarce, their use as luxuries will be stinted, and part of the supply formerly so used will be thrown into circulation, and the natural effect of scarcity to raise their value will be proportionally counteracted. These qualities being in a special degree characteristic of those metals, it follows that when there is a change in the relative value of these metals compared with that of other commodities, it more frequently happens that the change has been caused by an alteration of the relation between the supply and demand in these other commodities than in the supply and demand of gold and silver. Comparing these metals together, these special qualities are, owing to its greater scarcity and the higher demand in which it is consequently held, possessed in a greater degree by gold than by silver.

It is only by degrees, and as the result of actual experience, that these qualities come to be understood as forming the true basis of a currency. Even now, while they are always rightly appreciated by those who are in the position to be practically interested in them, their theoretical bearings are frequently misconceived by the very individuals who are most familiar with their application. This misconception arises chiefly from a complication to which in the process of development the natural principles of a currency are subjected. While this natural development is going on, it is met and absorbed by an artificial one, or at least one founded on a set of principles springing from a different source, and foreign to the natural development of a currency, the principles of governmental control and interference. There are several points at which the functions of a government come in contact with the operations of a currency, and when some kind of governmental interference becomes inevitable. Like all other mercantile transactions, these operations give scope for fraud, and it is the duty of a government to protect its subjects against fraud. As long as a currency consists only of certain commodities having a limited preference for the convenience of certain classes of traders, the interference of government can hardly be extended beyond such regulations as ordinarily protect trade. The value of these commodities fluctuates like that of others, and those who receive them must be able to some extent to judge of it themselves. The man who receives six sheep in exchange for some piece of handicraft will probably know the condition and value of the sheep as well as the man who gives them; but it is different when one or two commodities like gold and silver come to have a universal acceptation as a medium of exchange. Commodities so used must pass through the hands of many people who have had no opportunity of becoming skilled judges of them, and much time will be saved in negotiation, and many frauds prevented, if some simple means be found of certifying their genuineness and purity. When such a currency becomes general a government has also a more direct interest in providing for its uniformity. It is compelled to receive it in payment of its own dues, and it saves the time of its own officials as well as that of private traders by making such provision. At first the interposition of government was commonly limited to stamping bars of metal of a certain standard of purity as genuine, leaving the responsibility to the purchasers of testing their weight. But even this operation consumed much time, and was often found inconvenient, and it soon became felt in civilized communities that a great additional convenience would be gained by government guaranteeing the weight as well as the fineness of the metal. Thus coining was originated, and the superior conveniences of a coined currency soon caused it in all well-organized communities to supersede all other media of exchange possessing a substantial value. The metal chiefly used in the currency of different countries varied according to the convenience of each state. In early times, when gold and silver were less generally diffused, iron, copper, and bronze formed the principal currency of many nations, and the weight of money was much greater than in modern times, a pound weight being a common unit of quantity when money was weighed. When coining was introduced each nation coined the metal most convenient for it, and frequently more than one metal was used, but as coinage had a tendency to diminish the bulk of the currency, and to give it greater local stability, gold and silver gradually superseded other materials in the more valuable part of the coinage of most countries, and one or other of them, or sometimes both, became an artificial standard of value in each country according to its particular convenience.

When a government had thus created a coinage, it naturally made laws in favour of its own creation. These might take the direction of prohibiting imitation or forbidding export. Thus a first series of currency laws and restrictions was originated.

While this development was going on with the substantial medium of exchange, the other form of currency, which we have distinguished from it as possessing a different character, was undergoing a parallel development. Duly to appreciate this movement, and its relation with that which we have just described, the essential differences between these two kinds of currency must be carefully noted. The fundamental difference is that the substantial currency is always meant to represent present value; whoever receives it takes it for its own sake alone, and does not expect to receive anything else, except what he may get in exchange for it; the non-substantial, or paper currency, always represents something else, and the holder may realize its value in another way besides exchanging it. It represents an obligation or debt of which he may claim payment, and its true character is that of a currency of credit. The development which this currency takes, like that of the other form, is at first natural and spontaneous, and, like it also, it comes at a certain point of its progress within the range of government interference and control. In all mercantile transactions, credit, or trust in the promises of others, holds a conspicuous place. When thus trust reaches a certain development, it is very common, especially with those who do not look beneath the surface, to talk of it as an excrescence, and to propose innumerable expedients for getting rid of it, but it is there by a necessary law which admits of no evasion. Of this credit a paper currency is the natural product. Wherever men make promises, they can be induced for a substantial consideration to reduce their promises to writing, and every such written promise which is in any degree transferable, forms to some extent a paper currency. In mercantile transactions such written promises very soon come into systematic use. They assume in particular a form to which we have already alluded in bills of exchange (see BILL). These documents afford facilities for exchanging values in distant transactions, and of systematizing credit in all, of which merchants are prompt to avail themselves. The sale and exchange of these documents thus becomes of sufficient importance to constitute a separate branch of business, associated with the borrowing and lending of money, properly so called, and banks are created. Before this stage has been reached, promissory documents have usually assumed that systematic form which connects them with a money currency, and brings them under the control of government. Such documents may very well exist, and undoubtedly have existed, previous to the creation of a standard of currency; but when such a standard has been created, these promises, especially when intended for circulation, tend to assume the invariable form of a promise to pay a certain amount of money estimated according to that standard. When such promises are issued to the public by a regularly organized body, such as a banking establishment, a government may very well be justified in imagining that it is entitled to take any precautions whereby their fulfilment may be made more secure. Hence arises a second series of currency laws and restrictions upon banking. Some details of the arrangements made in particular countries will be found in our article BANK.

The creation by artificial arrangements of national currencies gives rise to another series of combinations which it is of the utmost importance to a correct view of the subject to understand. Up to this point in the process of development the only fundamental distinction that arises is that already described between a real, or substantial, and a nominal, or credit currency; but while the organization of a national currency tends to make a uniform currency within a certain range, it also restricts it to that range. The currency laws of a nation are for that nation alone; but as the mercantile transactions of the nation cannot be confined within its own limits, they necessarily extend beyond these laws, and come in contact with the currency laws of other nations. Before there were any national regulations, the monetary transactions of individuals in different communities were not distinguished, except by distance, from those of individuals in the same community; after such regulations are established they are distinguished. This distinction is the last great step in the development of a currency, and we find accordingly that currency in its latest organization may be divided into three great branches. There is first a spontaneous currency, which springs up without any organization; secondly, a national currency, which is the complete development of an artificial organization for a particular community; and lastly, an international currency, which is the result of a spontaneous currency in the transactions between individuals or corporations in different communities as affected by the artificial organizations of these communities. Each of these divides itself into the two classes already named, of a real and a nominal currency.

Of the questions agitated with regard to government interference with the currency, the most intricate, and those which give rise to the greatest diversity of opinion, refer to the nominal or paper currency. The most important question in respect to a real currency is the fixing of a standard of value. The solution of this question will be best indicated by what has been done in this country. The earliest standard here appears to have been silver, and the pound weight formed a sort of unit by which the value in silver of other commodities was estimated. Gold coined abroad was introduced into England and circulated from about the ninth to the fourteenth century, the coinage of Constantinople being first used, and afterwards that of Florence. From 1257, when gold was first coined in England, it passed current at rates fixed from time to time by royal proclamation, until 1664, when the guinea, then first coined, was allowed to pass current, without valuation, according to the relative worth of gold and silver in the market. There were thus at this time two current standards of value, without any restriction as to their relative position. In 1717 the rate at which the guinea should exchange was fixed at 21*s*. Till 1774 both gold and silver were legal tenders, but all large payments were made in gold, which was then overvalued relatively to silver. New silver coins were exported as soon as they came from the mint. In 1774 it was enacted that no tender of silver coin by tale should be legal for more than £25, and that larger tenders by weight should be valued at 5*s*. 2*d*. per oz. Gold had now first assumed an ascendency in the currency. In 1816 the value of silver was raised above its just proportion by coining 66*s*. instead of 62*s*. out of the pound troy, 4*s*. being retained by government as a seigniorage. To prevent it from superseding gold in the currency, silver was now made a legal tender only to the extent of 40*s*. This arrangement still continues, gold being coined at £3, 17*s*. 10½*d*. per ounce. The exportation of gold and silver coin was prohibited until 1819, when it was left without restriction.

A currency properly admits of only one standard of value. When matters are left to their natural course the commodity which possesses in the highest

degree the requisite qualities naturally becomes the standard for all others. In the temporary absence of this commodity another may take its place, but on its re-appearance it assumes its wonted sway. Thus in nature the tendency is always to gravitate towards a single centre. The commodity which forms the natural standard is gold. This is proved by the course of international currency, which follows the direction of nature. National currencies affect but they do not control international currency, and there is no other authority which can impose laws upon it. Consequently that which happens in international currency is the best indication that remains of the course of nature. Now in international currency gold is the one universal medium. Silver ranks next, but far below it, although for a time it may in some countries out of the full tide of commerce have the preference. Those countries which take gold for a currency thus follow the course of nature; those which take silver or any other metal follow exceptional circumstances.

When more than one metal is used in a national currency, there arises a difficulty in regard to the establishing of a standard, as may be observed from the changes which have taken place in our own country. If the two metals are allowed to circulate freely at a fixed ratio to each other, the fluctuations in their real value will cause divergencies in opposite directions from the nominal standard, and debts will be paid now in one and now in the other, according as the obligation may be most easily discharged, considerable injustice being done to creditors through liabilities being incurred by one standard and discharged by another. This is best avoided by the plan now adopted in this country, of making one metal only a legal tender for considerable payments, and using others only to a limited extent for the convenience of smaller transactions.

The efficiency of a standard, as has been pointed out, depends on steadiness of value produced by a general constancy in the relation between supply and demand. One of the most common of popular errors in regard to a currency consists in overlooking this. When a great discovery of gold is made, as occurred recently in Australia and California, it is very commonly spoken of as if it were calculated to afford some extraordinary facilities for commerce. The immediate effect of such discoveries is to unsettle the value of the principal medium of exchange, and render it temporarily unsuitable for its purpose, whence arises a great derangement of the relations of industry, particularly in the directions in which the new current of supply chiefly flows. If such fresh discoveries were to be made frequently, the particular metal affected by them would become wholly unsuited for the purposes of a currency. The ultimate effect of a particular enlargement of the supply is merely to afford an additional number of counters of an equal size for carrying on the commerce of the world, which when the field of that commerce is expanding, amounts to a mechanical convenience and nothing more. The basis of the common error is so simple that it hardly requires exposure when attention is turned directly to it, yet so deceptive is self-interest that it prevails under very thin disguises even among well-informed people. The commodity which constitutes a currency must, when the condition of uniformity is complied with, be difficult to procure, and this difficulty of procuring it when it is very much wanted causes all sorts of inconveniences which are only inferior to those which would arise from its being got more easily. The inconveniences arising from the scarcity of the currency press upon every one, and compel universal attention; those which would arise from any arbitrary increase of it are a little less obvious, and may escape the notice of those who do not look for them.

The chief duty of a government in regard to a real currency is to maintain the uniformity of the standard, and it is worthy of observation that this duty has throughout the civilized world been very ill performed. A government may very well protect its subjects against the minor frauds which they may be disposed to practise on each other, but there is no government which has not at some time or other failed to protect them against the greater frauds which it is able to perpetrate on them all. The stamp of a government gives no additional value to a currency. It is only a certificate of value upon which general reliance is placed. Thus in times of difficulty, by placing the same certificate on a coin of inferior value, a government can always procure supplies at an easier rate, the loss ultimately falling on the holders of the debased coinage. This is a fraud which few governments have been able to avoid. To trace its history is to trace the history of coinage, and its records remain in the very names by which the coins of civilized nations are called. Another device more legitimate but hardly less dangerous is to substitute a paper for a metallic, a nominal for a real currency. This is in fact to impose an open but forced taxation of an undetermined amount.

The question as to the duty of a government in regard to a paper currency has been much obscured by the want of a clear apprehension of the distinction between a real and a nominal currency. The doctrine of orthodox English writers on the currency of the absolute convertibility of the bank-note, by which is intended a convertibility provided for by the action of government, is not based on anything in the nature and reason of the case, and seems to proceed on an altogether exaggerated and inaccurate notion of the functions of a government. Another idea that the issue of paper money ought to be wholly controlled by government, or ought to rest entirely upon government credit, takes not only a view of the trustworthiness of governments quite unwarranted by history, but misconceives the nature and objects of a paper currency altogether. The advocates of a state bank of issue have the singular infelicity of combining in their scheme the disadvantages of a free and a restricted currency. To avoid the minor risks of private banking, they would repose a confidence in the state of which it has given no proof of being worthy; and they would, at the same time, deprive paper-money of its natural development, and take away its proper securities, by isolating it from its source in mercantile demand.

It is first of all important to observe that the claim of a government to deal with a currency of any kind, whether real or nominal, is not based upon origination. A currency is not, as is frequently supposed, one of the things which arise out of the functions of government, and which may be ordered in any way subservient to the performance of these functions. It has a separate origin, and must be dealt with according to its own nature. The duties of government in regard to it are regulative and not proprietary. With regard to a real currency, a government does not suppress the spontaneous tendency to create one by prohibitions; it absorbs it by fully meeting the want from which it springs. This is proved by the fact that wherever a government, from whatever circumstances, fails to meet this want, the spontaneous tendency springs into activity again.

A paper currency likewise springs from a spontaneous and irrepressible tendency of commercial life, the legitimate development of which cannot be prevented without injury, and which will find expression

in some way, whatever efforts may be made to restrain it. This tendency, as we have seen, differs in nature and origin from that which leads to the creation of a real currency. In some respects they are similar; in one they are nearly opposite. Their agreement and opposition may be best observed in the working of an international currency, which is the freest expression of their natural development. In all transactions between different countries gold is the universal and final solvent, but for this very reason there are many transactions finished without gold. Whenever, in fact, other arrangements can be made to the satisfaction of the parties, gold is dispensed with, because, from the universal demand for it, it is the most expensive mode of settling. Barters are consequently made of the products of different countries; and when these barters cannot be made directly, bills of exchange are interposed. These bills are usually drawn for a particular amount in a given currency, but this is only a conventional mode of giving effect to a particular form of credit. The real meaning of the bill is not that the party drawing it has an actual claim on the party on whom it is drawn for a certain amount of gold or silver, but that he proposes to constitute such a claim by the shipment of certain produce. It is not necessary to the good faith of such a bill that either the drawer or the drawee should be in possession of any gold or silver, but only that the drawer should have certain produce, and that the drawee should be willing to risk its realizing a certain quantity of gold or silver. The transaction is one of trust on the one hand, and of responsibility on the other. Thus, while gold and silver are the standards of value, many things besides gold and silver form the real bases of transactions in foreign trade. So it is with the spontaneous paper currency of the home trade. A promise to pay gold or silver does not imply the actual possession, but rather the actual non-possession of gold or silver; and yet such promises may be genuine and well-founded. They are based on the exchangeableness of gold and silver, and the possession of other real value. Such promises are an inseparable adjunct of mercantile transactions. A currency is only a convenient means for giving them expression, and banks are only an organized development of the tendency of commerce to produce them. The fact that promises to pay in currency on demand are issued by public institutions may be urged as a reason why such promises should be backed by the actual holding of the thing promised; but this is by no means implied in the circumstances of the case. All that such a promise implies, when made freely and without the interposition of any interpretation imposed by external authority, is that that bank undertakes to keep as much gold as will meet the current demand on it. One thing which has helped very much to obscure this question is the desire which many governments have to maintain a paper-currency more or less founded on their own credit. If this evil is avoided, if a government does not enforce any paper as a legal tender within its jurisdiction, and if it maintains the uniformity of its real currency, all that the natural circumstances of the case seem to require of it in regard to a paper currency is to frame and enforce such regulations as may be necessary to prevent fraud. The argument of most apparent weight against a free paper currency is that derived from the inconveniences which might arise from the fluctuations of a currency in common use. Two reasons may be given for assuming that the thing apprehended would not in the supposed circumstances occur. A banker might easily force promises upon his own customers which his credit was unable to sustain, but nothing he could do would prevent these promises from falling in value in the market; and as he would be compelled in all circumstances to redeem them at par, the depreciation of his promises would be an actual loss to him. No banker consequently would dare to issue notes the credit of which he was not able fully to sustain. But if from any laxity of mercantile practice such notes did become current, another effect would be produced. In mercantile circles, and among men who were able to estimate their value, such notes might circulate like mercantile bills, or any other private currency; but in any country where there was an efficient real currency they would not be received in private transactions, by retail dealers, or by any one who received no consideration for accepting them. Whenever there was the smallest doubt of its convertibility paper-money would be banished from the transactions of every-day life, and confined to the mercantile circles which knew how to appreciate it.

CURRENTS, MARINE, are phenomena of the highest importance in practical navigation. They are streams or rivers of the ocean, and, like the rivers of the land, accelerate or retard the course of the mariner according as the vessel's course is with or against the direction of the stream. With extended navigation of the most distant waters of the globe, increasing attention has naturally been bestowed on the subject of currents, with a view not merely to map down their various courses, but also to elucidate the causes to which they owe their origin. Their recognized influence upon the climates of maritime regions—an influence which extends far inland—gives them additional interest as belonging to the subject of physical geography, of which study, indeed, they constitute one of the most important chapters.

Of the various theories which have been framed with a view to account for the existence of currents, the axial motion of the earth, and the varying densities of the sea under different parallels, have in nearly all cases formed a part. The theory of a circuit maintained between the equatorial and polar waters, due to their varying density, is distinctly stated by Lyell (Principles of Geology) and by Maury (Physical Geography of the Sea). This theory has within a recent period engaged renewed attention, and has undoubtedly received additional strength from the interesting researches of Dr. Carpenter, who, with great ingenuity and by exceedingly simple means, has given experimental confirmation of its sufficiency as a *vera causa*. Other causes—amongst them the earth's axial movement from west to east, and the perennial winds of tropical latitudes, combined with the shape of the continents—also operate in the production of the ocean streams, and give special direction to their movements.

Sea water, unlike fresh water, which has its maximum density at a temperature of 39° or 40° Fahrenheit, continues to increase in density down to its freezing-point, about 25° Fahrenheit. The waters within two extensive areas of the globe, that is, the polar regions of either hemisphere, owing to their generally low temperature (which during a large portion of the year exhibits an intensity of cold of which it is difficult to realize an adequate conception, but of which the polar ice and the huge icebergs derived thence are the unfailing evidence), have a density many degrees in excess of that belonging to the waters of the tropical belt. This difference, though subject to some amount of seasonal modification, is yet permanent, since the brief summer-heat of high latitudes penetrates but a little way below the surface, and can scarcely affect the mean temperature of the water at even a moderate depth. There is thus, in either hemisphere, an area within which the waters of the ocean are colder, and hence, by

many degrees, denser, than within the belt of the tropics. The natural result is a tendency of the colder and heavier water to sink, and to diffuse itself over the lower portion of the ocean-bed, and a movement of the warmer and lighter water in the direction of the surface, over which it tends to become diffused. In other words, the colder waters will move beneath the surface in the direction of the equator; and the warmer waters will flow along the surface in the direction of either pole. Hence, in either half of the globe, two great and opposite currents—a *cold* current flowing from the pole towards the equator, and a *warm* current flowing from the equator in the direction of the pole. The means by which Dr. Carpenter illustrates this natural movement on the part of fluids, or portions of the same fluid, of various densities, in contact with one another, and with free movement between their various parts, consists simply in placing at one end of a narrow trough of glass, filled with water, a lump of ice, and at the other end a bar of iron, heated by the flame of a spirit-lamp. If a few drops of blue colouring liquid be introduced into the colder end of the vessel, and a like quantity of red-coloured liquid similarly introduced into the other or warmth-receiving end, so as to render any movement of the water visible, it will be seen that a circuit is gradually produced. The colder and heavier water sinks to the bottom and spreads over it, the warmer and lighter water rises, and diffuses itself over the surface. A circuit or double current is thus formed, which lasts as long as the causes to which the difference of density is due are maintained in operation. This, on a small scale, is exactly what is maintained within the ocean-bed of either hemisphere upon a large scale—the heated bar of metal representing the perennial warmth of tropical latitudes, and the lump of ice taking the place of the vast ice-fields and icebergs of polar waters. It is the intense cold by which the latter are occasioned that we must regard as, in the main, the originating cause of currents, though other influences, some of them of high importance, require to be taken into account. Amongst the latter, the influence exerted by the axial rotation of the globe takes the first place.

The axial rotation of the earth is an eastwardly motion. In virtue of it, everything on the surface of the globe is constantly moving to the eastward. The maximum rapidity of this motion is of course found under the equator, a circle which measures 25,000 miles, and the complete rotation of which within twenty-four hours is equivalent, in the case of any particular spot, to a rate of above 1000 miles an hour. The actual rate of eastwardly motion becomes continually diminished with the diminishing magnitude of the successive parallels of latitude. Under the parallel of 60°, for example, a circle of only 12,000 miles, or half the measure of the equator, is carried round within the same period of twenty-four hours—giving to any particular spot on it a rate of only 500 miles per hour. At the pole itself axial motion vanishes. But persistence in motion is a well-known law of nature. Velocity of motion in any given direction is only gradually lost, as any increase in its amount is capable only of gradual acquisition. The maximum of eastwardly tendency proper to the waters of tropical seas is maintained, or but gradually lessened, in the course of their advance in the direction of the pole, and the result must be, in the case of the northern hemisphere, a north-eastwardly direction; in the southern half of the globe, a south-eastwardly direction. That is, the movement of tropical waters towards the pole, which, were the earth at rest, would be a movement, in the one hemisphere, from south to north, in the other from north to south, is deflected to the *eastward* of the meridian. In other words, the warm current which advances from the tropical belt in the direction of the pole only gradually loses its excess of eastwardly motion; hence, deflected to the eastward of the meridian, it becomes in the northern hemisphere a *north-eastwardly* current, and as such is directed towards the western shores of Europe, and to the western shores of the New World within similar latitudes. In the southern hemisphere the like condition produces a *south-eastwardly* current, instead of one flowing due south.

Under the operation of the same laws the streams that set out from polar latitudes in the direction of the equator, failing to acquire, or only gradually acquiring, the increasing rate of axial or eastwardly motion which belongs to the lower parallels towards which they are advancing, continually fall to the *westward* of the meridian. The actual direction of their movement is hence, in the northern hemisphere, to the westward of south—that is, the polar current becomes a *south-westerly* current, and meets the easterly shores of the continent towards which it is directed—the shores, namely, of Eastern Asia and the eastern side of the American continent. In the southern hemisphere the correspondent stream becomes a *north-westerly* instead of a northerly current. Proof that such is the actual direction of the great ocean streams is afforded by the fact of the productions of the torrid zone (tropical fruits, &c.) being continually thrown upon the coasts of Western Europe, and by the vast icebergs—the produce of glaciers which overhang the waters of Baffin Bay and the Greenland Sea—carried towards the Atlantic coasts of the New World. It is to such influences that we may, in the main, safely attribute the well-known differences between the climates of Europe and North America within correspondent parallels on either side of the Atlantic, and the like differences between Western North America and Eastern Asia upon opposite sides of the Pacific. And this we believe to be the true explanation of the fact that west coasts are warmer than east coasts: the former are continually subject to influences communicated by the tropical waters moving from the direction of south-west; the latter as constantly receiving the influences of waters coming from the direction of north-east, with the moving masses of ice (only the upper portions of which are above the surface, the vast bulk of the advancing ice-mountain being below the water-line, and subject to the conditions which affect the sea at considerable depths) as their evidence. The deep-sea currents of either ocean may thus, with great probability, be traced to an origin in polar or tropical waters respectively, and are to be classed under the head of cold or warm currents accordingly. But the varying depths of the ocean-bed, and yet more the shapes of the land, materially modify, in many cases, the direction of their streams.

A distinction, however, must be drawn between deep-sea currents and surface or drift currents. It is probable that the latter owe their origin chiefly, if not wholly, to the action of the winds, which, within certain well-defined areas, are either perennial or seasonal. The belts of the Atlantic and Pacific over which the trade-winds blow are also those within which the westward-going or equatorial currents of those oceans are experienced. It is to the constant drift of surface-water to the westward, under the influence of the trade-wind, that the Equatorial Current of the Atlantic, and the similar Equatorial Current of the Pacific Ocean, are due. Within that portion of the Indian Ocean over which a perennial wind, correspondent in direction to the trade-winds of the Atlantic and Pacific, is experienced, that is, to the southward of the parallel of 5° or 6° south latitude,

a like westward-setting current is found. In northwardly half of the same basin—that is, within the monsoon-area of the Indian Ocean, and also within the like area of the China and adjacent seas—the currents undergo a like change of direction to the monsoons themselves.

The Equatorial Currents, with the counter-streams to which, under the influence of obstructions presented by the land, they give origin, are amongst the most important phenomena of the globe's surface. In the case of the Atlantic Ocean, the western limit of which is formed by a continuous mainland, unbroken through 110° of the meridian (from the entrance of Hudson Bay to the Strait of Magellan), or upwards of 7000 miles, the obstacle to further westwardly progress of the intra-tropical waters gives origin, there can be little doubt, to the Gulf-stream within its northwardly half, and to the Brazil current under its more southern parallels. The westward-moving waters, encountering the eastward extension of the South American mainland, become of necessity divided into two streams, the one of which sets to the southward along the eastern coasts of Brazil, while the other advances along the more northwardly portions of the South American *terra firma*, past the outlets of the Amazons and the Orinoco, and thence into the Caribbean Sea. From the latter land-inclosed basin its course is necessarily into the similarly shut-in basin of the Mexican Gulf, whence it finally emerges through the narrow channel of Florida as the well-known Gulf-stream. The origin thus attributed to this famous current is in harmony with recognized laws relating to the movement of fluids acted on by a persistent force (such as the trade-winds supply), and under the influence of any opposing obstacle to farther advance in a given direction. In the case of the Pacific Ocean there exists no such complete obstruction to the westwardly progress of the equatorial waters, since the islands of the Malay Archipelago take the place which within correspondent parallels of the Atlantic is occupied by an unbroken line of coast. A portion of its Equatorial stream, however, is deflected to the northward towards the coasts of Japan (where it forms the well-known Japan-stream, setting to the north-eastward, past the Kuriles, in the direction of the Aleutian Islands), while another portion turns southwardly in the direction of Australia and New Zealand. In like manner, that portion of the Indian Ocean where alone a westwardly motion is constant—that is, the southern half of its basin—gives origin to a stream which, setting along the eastern shores of Madagascar and past the entrance of the Mozambique Channel, forms the initial portion of the Lagullas or Agulhas current. This latter sets in part round the headland whence its name is derived, carrying some of the waters of the Indian Ocean into the Atlantic; but a large portion of its waters (probably the larger), deflected by the extensive submarine elevation of the Agulhas Bank, returns into the Indian Ocean, forming part of a general eastwardly drift, within higher latitudes, in the direction of Australia.

The courses of these and other known currents are indicated on the Chart (Pl. XL. XLI.), which is deserving of attentive study; since it would be difficult to overrate the importance of the place which currents take in regulating the distribution of temperature over the globe. But geographers were long led to entertain (and some still entertain) what seems to us a very exaggerated estimate of the results due to the one of them to which reference is most frequently made, namely, the 'Gulf-stream.' Recent observation and measurement have materially diminished this estimate. As a local current, however, the Gulf-stream is undoubtedly of high importance, and within certain limits it is one of the most powerful of currents. The initial portion of its stream has been already traced. From its issue through the Florida Channel the course of the Gulf-stream is to the north and eastward, in a direction parallel to the coast-line of the United States, past Cape Hatteras (lat. 35° 13′), and along the southern edge of the 'great banks' of Nantucket and Newfoundland (between the meridians of 48° and 60° west of Greenwich), beyond which its existence as a distinct current cannot be traced, the farther course of its waters being absorbed in the general north-eastwardly movement of the Atlantic, as described above.

Throughout the earlier portion of its course, and especially within its narrowest section, between the mainland of Florida and the little group of the Bemini Islands (lat. 25° 40′; lon. 75° 15′), the Gulf-stream constitutes a well-defined channel, the water of which is distinguished from that of the ocean upon either side, alike by its higher temperature and by its deep blue or indigo colour. The difference of temperature is more marked by comparison with the coast-water—that is, the channel lying between the Gulf-stream itself and the shore-line of the United States—than with the open sea to the eastward of its course; a consequence of the fact that a belt of cold water, derived from the Polar or Baffin Bay current, and setting in the opposite direction to the Gulf-stream itself, flows side by side with the warmer current immediately along the mainland. The difference of temperature between the water of the Gulf-stream and that of the adjacent cold current on its inland side amounts at some seasons to as much as 20° (or even 30°) Fahr. This maximum difference of temperature, however, is perceptibly lessened after the current has passed the parallel of Cape Hatteras, and is gradually diminished in its farther course to the north-eastward. The warm waters of the Gulf-stream, and the cold waters of the Greenland or Baffin Bay current, interlace off the 'great bank' of Newfoundland, before reaching which the former has already so greatly diminished in depth as to have again become, what we regard it as having been in its origin, a mere surface-drift.

The velocity of the Gulf-stream is naturally greatest within the earlier and narrower portion of its course, that is, within the Strait of Florida, where it is equivalent to a mean of about 65 miles per day. This diminishes to 56 miles off Charleston, 36 to 46 miles off Nantucket, and 28 miles to the south of the Newfoundland Banks. The high temperature of its waters, even within its narrower and more strongly-marked portion, is not maintained to the bottom of its channel, but is proved to give place at less than half its total depth to a much lower temperature. The observed temperature of the sea at the bottom of the Florida Channel—that is, within the most powerful portion of the Gulf-stream—is only 45°, while the surface-temperature varies between 80° and 84°! So greatly has popular belief, based upon scientific theories formed in the absence of observation, exaggerated the distinguishing conditions of this famous current. The Gulf-stream is undoubtedly of great importance as a local current, and plays its part in the general circuit of the North Atlantic waters. A general surface-drift to the eastward, in the direction of the African continent, is traceable between the parallels of 30° and 35°, its limits undergoing some variation with the seasons. This constitutes a return or counter movement to the westwardly drift of the equatorial Atlantic, and, combined with a southwardly set of the waters off the western coast of Africa, involves a general circuit of waters round a vast area of the North Atlantic

Ocean, within which area are found the masses of floating weed known as the *sargasso* or gulf-weed. As to the supposed *direct* influence of the Gulf-stream upon the climate of Western Europe, it may, we conceive, be safely dismissed as belonging to the realm of fancy. Indirectly, the warmth-giving influence of this famous current, such as it is, harmonizes with the more extended results due to the general set of the tropical waters in the direction of Europe. But the supposition that a narrow (and at the same time shallow) current, such as the Gulf-stream is proved, by direct observation, to be, can impart any appreciable warmth to the shores of Western and North-western Europe—nay, even (as the advocates of such a theory insist to be the case) to the waters that wash the shores of Nova Zembla and the Arctic coasts of Europe and Asia, and *that* after a course of some thousands of miles across an open expanse of ocean—seems to us quite at variance with probability, besides its inconsistency with known laws respecting the temperature of fluids in motion. The few degrees of superior heat that belong to the Gulf-stream after it has passed Cape Hatteras must be lost long before the mid-ocean is reached. And the permanently high temperature of the west and north-west European seaboard is sufficiently accounted for, as we have seen, by other conditions. The courses of the Gulf-stream and other principal currents will be found indicated upon the accompanying chart (Pl. XL. XLI.)

In the attempt to frame a theory which accounts satisfactorily for the existence and general movements of ocean-currents, the many local conditions which affect particular parts of the sea can receive but the briefest reference. Tidal currents, due to the local ebb and flow, as experienced in narrow seas, are of distinct origin. See further under OCEAN.

CURRIE, JAMES, M.D., the biographer of Burns, was the son of the minister of Kirkpatrick-Fleming, near Moffat, in Dumfriesshire, and was born there on the 31st May, 1756. He received the rudiments of his education at the parish school of Middlebie, and was sent at the age of thirteen to a seminary at Dumfries conducted by a Dr. Chapman. Having accompanied his father on a visit to Glasgow, he was induced to enter there into the service of a company of merchants who were going out to Virginia on a mercantile speculation. This voyage proved most unfortunate, owing to the breaking out of the dissensions between America and the mother country; and he was but indifferently treated by his employers, who were probably soured by the failure of their commercial plans. Abandoning the pursuits of commerce, he turned his thoughts towards politics, and espousing the cause of the mother country, published a series of letters in an American paper under the signature of 'An Old Man.' Soon afterwards having gone to reside with his near relation, Dr. Currie of Richmond, America, he was decided by his advice to return to the study of medicine, and in consequence proceeded to England, where he arrived in 1776. From thence he went to Edinburgh, where he pursued his medical studies with great assiduity till 1780. He was now appointed to an ensignsy and assistant-surgeoncy in the army, through the interest of General Sir William Erskine. Soon after, with a view to obtaining the situation of physician or assistant-physician to the troops that were then about to set out to Jamaica, he proceeded to Glasgow, where he took his degree as Doctor in Medicine. Having been disappointed, however, in his views, he was about to go out and settle himself in the West Indies, when he was attacked with a pulmonic complaint, on recovering from which he was induced by the advice of his friends to go and settle at Liverpool, in October, 1780. Here he was soon elected to be one of the physicians to the infirmary; and in 1783 married Miss Lucy Wallace, daughter of a respectable merchant, by whom he had several children. In 1791 he presented to the Royal Society a paper, which he subsequently published in 1797 in an extended form, on the therapeutic effects of cold and warm water. Both of these added considerably to his reputation. Having made an excursion into Scotland in 1792, he had become personally acquainted with Robert Burns, with whose wonderful powers he was fascinated; and upon the death of the poet he was induced, at the request of his old friend Mr. Syme, to become the editor of a complete edition of his works, to which he added a memoir. By this work, which long retained its place as the standard edition of Burns' poems, Dr. Currie is principally known at the present day. In 1804 the return of a severe pulmonary attack obliged him to relinquish his practice at Liverpool; and he died (Aug. 31, 1805) at Sidmouth in Devonshire.

CURRYING is the art of dressing cow-hides, calves'-skins, seal-skins, &c., principally for shoes, saddlery, or harness, after they have come from the tanner. In dressing leather for shoes the first operation is soaking the leather in water until it is thoroughly wet: then the flesh side of the leather is shaved on a beam about 7 or 8 inches broad, with a knife of peculiar construction, to a proper substance, according to the custom of the country and the uses to which it is to be applied. This is one of the most curious and laborious operations in the whole business of currying. The knife used for this purpose is of a rectangular form, with two handles, one at each end, and a double edge. After the leather is properly shaved it is thrown into the water again, and scoured upon a board or stone commonly appropriated to that use. Scouring is performed by rubbing the grain or hair side with a piece of pumice stone, or with some other stone of a good grit. These stones force out of the leather a white substance called the *bloom*, produced by the oak-bark in tanning. The hide or skin is then conveyed to the drying-loft, where a greasy substance is applied, termed *stuffing* or *dubbing*, after which the leather is hung up to dry. When it is thoroughly dry an instrument with teeth on the under side, called a *graining-board*, is first applied to the flesh side, which is called *graining;* then to the grain side, called *bruising*. The whole of this operation is intended to soften the leather to which it is applied. *Whitening* or *paring* succeeds, which is performed with a fine edge to the knife already described, and used in taking off the grease from the flesh. It is then boarded up, or grained again, by applying the graining-board first to the grain and then to the flesh. It is now fit for *waxing* or *colouring*. This is effected by rubbing with a brush dipped in a composition of oil and lamp-black on the flesh, till it be thoroughly black; it is then sized, called *black-sizing*, with a brush or sponge, dried and tallowed; and, when dry, this sort of leather, called *waxed* or *black on the flesh*, is curried. The currying of leather on the hair or grain side, called *black on the grain*, is the same with currying on the flesh, until after the operation of dubbing. The grain side of the dry leather is then saturated with urine by means of a brush, or more commonly with a solution of soda in water, after which a preparation of iron in solution is laid on, and this gives it the black colour. After undergoing some more manipulation by which all marks and wrinkles are taken out of it, it receives a thin coating of weak size, and is now said to be *seasoned*. When it is thoroughly dry it is whitened, bruised again, and grained in two or three different ways,

and when oiled upon the grain, with a mixture of oil and tallow, it is finished.

CURRY-POWDER. See TURMERIC.

CURSORES, or RUNNERS, an order of birds, which includes the ostrich, rhea, emeu, cassowary, and apteryx. The birds of this order are distinguished by the rudimentary character of their wings, which are too short to be of use for flight, and by the length and strength of their legs. The breast-bone is destitute of the ridge or keel which it possesses in most birds. The hind toe is wanting in all except the apteryx, in which it is rudimentary; the anterior toes are two or three in number. The barbs of the feathers are disconnected, and present a considerable resemblance to hairs. The order has been divided into the two families—Struthionidæ and Apterygidæ, the latter of which includes only the apteryx of New Zealand. Some gigantic members of this order, such as the dinornis, lived on the earth in former times, and their remains have been found in a fossil state.

CURTIUS, MARCUS, a noble Roman youth, known by the heroic manner in which, according to tradition, he sacrificed himself for the good of his country. In B.C. 362 it is said a chasm opened in the Roman forum, from which issued pestilential vapours. The oracle declared that the chasm would close whenever that which constituted the glory of Rome should be thrown into it. Curtius asked if anything in Rome was more precious than arms and valour; and being answered in the negative, he arrayed himself in armour, mounted a horse splendidly equipped, solemnly devoted himself to death in presence of the Roman people, and sprang into the abyss, which instantly closed over him.

CURTIUS RUFUS, QUINTUS, the author of a History of Alexander the Great, in ten books, the two first of which are lost. Nothing certain is known about him; the various authorities differing considerably as to the time in which he lived, some saying under Tiberius, others under Constantine, and others even under Theodosius the Great. F. A. Wolf is inclined to think that the rhetorician L. Curtius Rufus, mentioned by Suetonius in his work De Claris Rhetoribus, is the same as the historian, and the artificial and ornate style of his work favours this idea. Curtius deserves no great praise as an historian. His style is florid, and his narratives have more of romance than of historical certainty. The lost parts have been supplied by Christopher Bruno, a Bavarian monk, in a short and dry manner; by Freinshemius, in a diffuse style; and by Christopher Cellarius, in a style which forms a medium between the two. The best editions are those of Mützell, with an ample commentary (Berlin, 1841, two vols.), and Zumpt (second edition, Brunswick, 1864). Buttmann, Hirt, and Niebuhr (the Roman historian) have written treatises on his life.

CURULE MAGISTRATES were the highest dignitaries of the Roman state, and distinguished from all others by enjoying the privilege of sitting on ivory chairs (*sellæ curules*) when engaged in their public functions. The curule magistrates were the consuls, prætors, censors, and chief ædiles, who, to distinguish them from the plebeian ædiles, were called *curule*.

CURVATURE. See CIRCULAR CURVATURE.

CURVES (from the Latin *curvus*, crooked, bent), in geometry. The simplest objects are the most difficult to be defined, and mathematicians have never succeeded in giving a definition, satisfactory to themselves, of a line. It is equally difficult to give a satisfactory definition of a curve. Perhaps the simplest explanation of it is, *a line which is not a straight line, nor made up of straight lines.* This definition, however, is deficient in mathematical precision. Since Descartes' application of algebra to geometry, the theory of the curves has received considerable extension. The study of the curves known to the ancients has become much easier, and new ones have been investigated. Curves form, at present, one of the most interesting and most important subjects of geometry. Such as have not all their parts in the same plane are called *curves of a double curvature.* The simplest of all curves is the circle. The spiral of Archimedes, the conchoid of Nicomedes, the cissoid of Diocles, the quadratrix of Dinostratus, &c., are celebrated curves.

CURVES, MAGNETIC, the lines in which iron-filings arrange themselves under the influence of magnetism are called *magnetic curves.* To exhibit them a sheet of smooth paper is stretched over the magnet or magnets to be employed, and fine iron-filings are carefully and uniformly scattered over it. It is then gently tapped, so as to toss the iron-filings a little from place to place, and the filings will be seen to arrange themselves in beautiful curves, which indicate the direction of the *lines of magnetic force.* The study of these curves is interesting and instructive. It is the easiest and simplest way of exhibiting lines of force to the eye. The curves may be made permanent by forming them on paper glazed with a thin coating of gum or other soluble size, and when the filings have taken their proper positions, exposing them to the steam of a kettle so as to dissolve the gum and allow the filings to sink into it. We have seen some beautiful specimens prepared thus by Faraday for the purpose of recording lines of force due to peculiar arrangements of magnets and magnetic matter.

CURZOLA (ancient *Corcyra-Nigra;* Slavonic, *Korzul*), the most beautiful of the Dalmatian islands, stretching W. to E. about 25 miles, with an average breadth of 4 miles; area, 85 square miles. It is separated by a narrow channel from the peninsula of Sabioncello, is covered in many places with magnificent timber, which descends the slopes to the water's edge, and has a climate well suited to the growth of the olive and vine. The fisheries are very productive. It contains a town, of the same name, situated on the north-east extremity of the strait, surrounded by massive walls, flanked with old towers, and defended by a fort. Its principal edifices are the church, finely situated on a height, and formerly a cathedral, and the old palace of the Venetian governors. The chief employment is ship-building. Pop. of town over 2000; of island, 6500.

CUSCO. See CUZCO.

CUSCUTACEÆ, the Dodder order, consisting of leafless parasitic twining herbs, sometimes reckoned a sub-order of the Convolvulus order. The seeds germinate in the usual way, and afterwards the plants become true parasites. In appearance the dodder resembles fleshy threads twisted round a branch, or small animal intestines, to which it owes one of its vulgar names—devil's-guts. Dodders inhabit all the temperate and warmer regions of the globe, and have been arranged by botanists in numerous species. Of these only four are known in this country—*Cuscuta Europæa* (greater dodder), with reddish stems and yellowish flowers in rather large clusters; *C. epilinum* (flax-dodder), with pale green stems and whitish flowers, and, as its name implies, infesting flax; *C. epithymum* (lesser dodder), with slender red stems and small white flowers, and common on thyme and small shrubs; and *C. trifolii* (clover-dodder), with reddish-yellow slender branching stems and small white flowers. The last, first brought from Affghanistan with lucerne seed or trefoil, spread rapidly over the country, and caused great alarm by its ravages in clover fields. When mixed with clover seed it

may be completely separated by careful sifting, as it is much smaller.

CUSH, the eldest son of Ham, and also a country frequently mentioned in the Old Testament. Cush, as a country, appears to be African in all passages except Gen. ii. 13, and it is suggested that there may have been a primeval and a postdiluvian Cush. The postdiluvian can be no other than the country in Africa, south of Egypt, corresponding to the modern regions of Nubia and Northern Abyssinia. That it adjoined Egypt is shown by the passage in Ezekiel which states that the desolation of Egypt is to extend 'from the tower of Syene unto the border of Cush.' In a number of passages also Cush, or its inhabitants, is mentioned in connection with Egypt. Cushites, for example, came out of Egypt with Shishak against Jerusalem. In other places again it is evident that the name Cush must be understood as referring to some part of Arabia. That several localities should be called by the same name may be explained by the frequent migrations of the early nations, who would give their own name to the countries into which they successively arrived.

CUSTARD, a composition of milk or cream, and eggs, sweetened with sugar, and variously flavoured. It may be cooked in the oven or stew-pan. The following is a recipe of M. Soyer.—Boiling milk one pint, sugar two oz., thin yellow peel of half a lemon, mix and set aside for a short time; then take four eggs, beat them well in a basin; add gradually the milk (not too hot); pass the mixture through a colander or sieve, and fill the custard cups with it. These are then to be placed in a stew-pan containing about one inch of hot water, and left over the fire for twelve minutes, or until sufficiently set. This makes a good plain custard, but it forms a basis to receive any of the ordinary flavouring ingredients, such as peels, fresh or stewed fruit, orange-flower water, brandy or other spirits, &c. A very rich custard may be made by using cream instead of milk as above, and putting in two additional eggs, flavouring according to taste.

CUSTARD APPLE (*Anona*), a delicious fruit, a native of the tropical parts of Asia, Africa, and America; the better sorts are found in the western half of the globe. Ten or twelve different kinds are enumerated, of which we mention the principal:—The *sour-sop* (*A. muricata*), found abundantly on the savannahs of Jamaica. The fruit is large and oval, and of a greenish-yellow colour, covered with small knobs, and containing a white pulp of a sweetish acid flavour, very cooling and agreeable.—The *cherimoyer* (*A. cherimolia*) is one of the finest Peruvian fruits, the product of a tree about 10 feet high. The fruit is of considerable size, somewhat heart-shaped, rough exterior, grayish-brown, often nearly black when ripe. The flesh is soft, sweet, and highly esteemed by natives and foreigners. The *sweet-sop* (*A. squamosa*) is little better than a bush, and is found in the East and West Indies: the rind of the fruit is strong and thick, but the pulp delicious, having the odour of rose-water, and tasting like clotted cream mixed with sugar.—The *alligator apple* (*A. palustris*), a smooth, shining fruit growing wild in the marshes of Jamaica, is a strong narcotic, and therefore not generally eaten.

CUSTINE, Astolphe, Marquis de, was the grandson of the Comte de Custine, guillotined during the French revolution, and was born at Paris in 1793. He wrote several novels, but the work by which he is best known is his La Russie en 1839, the result of an extensive tour in that country, which gives an instructive but by no means flattering portraiture of Russia and Russian institutions. It obtained a large amount of popularity, was translated into several languages, and was much read in this country during the Russian war. He died at his château of St. Gratien, near Pau, in September, 1857.

CUSTOM-HOUSE, an establishment where commodities are entered for importation or exportation; where the duties, bounties, or drawbacks, payable or receivable upon such importation or exportation, are paid or received, and where ships are entered and cleared, &c. The principal British custom-house is in London; but there are custom-houses subordinate to it in all important seaport and in a few inland towns.

CUSTOMS, duties charged upon goods exported from or imported into a state. Such duties seem to have been levied in every commercial country. The Athenians imposed a tax of 20 per cent. on the corn and other merchandise imported from abroad, and also on several articles brought from Attica. The *portoria*, or duties paid on the exports and imports of Rome, formed an important part of the public revenue. The rates at which they were charged were fluctuating and various. Cicero informs us that the duties on corn exported from Sicily were in his time 5 per cent. During the empire the amount of the portoria depended as much on the caprice of the prince as the necessities of the state. Under the Eastern Empire they were sometimes as high as 12½ per cent. Customs duties were levied in England before the Conquest. They derive their name from having been immemorially or customarily charged on certain articles when conveyed across the principal bridges and ferries within the kingdom, and on these and other native and foreign productions when exported or imported. The duties were at first principally laid on wool, sheep-skin, and leather. The duties of tonnage and poundage, so often mentioned in English history, were customs duties: the first being paid on wine by the *tun;* the second being an *ad valorem* duty of so much per pound on all other goods. When these duties were granted to the crown they were called subsidies, and as the duty of poundage had long continued at 1*s.* a pound, a subsidy came, in the language of the customs, to mean an *ad valorem* duty of 5 per cent. The new subsidy granted in the reign of William III. was an addition of 5 per cent. on most imported commodities. The various customs duties were collected for the first time in a book of rates published under Charles II., and again in a book published in the reign of George I. But exclusive of the duties specified in these two books, many more had been imposed at different times, so that the accumulation of the duties, and the complicated regulations necessitated by them, created considerable confusion in the commercial world. The whole system had got so complicated that even the most intelligent merchants were ignorant of the exact sum chargeable on a certain commodity, and they had to throw themselves upon the mercy of the custom-house officials. The Customs Consolidation Act, introduced by Mr. Pitt in 1787, did away with much of this confusion. The existing duties on all articles were abolished, and one single duty on each article was substituted, which was equal to the sum of the various duties by which it had been formerly loaded. A more simple and uniform system was at the same time introduced into the custom-house. A second consolidation, rendered necessary by the complications in the duties, in consequence of the struggle ending 1815, was effected in 1825. The acts repealed on this occasion amounted to 443, and the laws of British customs were consolidated into eleven acts. The numerous reforms effected by Sir Robert Peel occasioned further changes; and, in addition, those carried out by Mr. Gladstone made a fresh consolidation of the

laws necessary. This was accomplished by the Customs Consolidation Act (16 and 17 Vict. cap. cvii.) This statute, though amended by subsequent acts, and especially the Consolidation Act (23 and 24 Vict. cap. cx.), comprises the whole law concerning the exportation and importation of goods, warehousing or bonding, and smuggling, with the regulations to be observed in the coasting and colonial trades.

Up to the reforms of Sir Robert Peel the number of articles liable to customs duties was enormous, a tax being laid upon almost every article of foreign produce, and sometimes even on raw material. But the success of that statesman's legislation has been so decided as to form a precedent for the simplification of the system, so that the only articles now subject to duty are chicory, cocoa, and coffee, confectionary, molasses, plate of foreign manufacture, paper, snuff, spirits, sugar, tea, tobacco, wine, vinegar, wood, and certain highly-saccharine fruits. It will be seen that these duties are to some extent levied on articles of voluntary consumption; in fact, the duties on spirits, wine, tobacco and snuff, constitute two-thirds of the whole. The duty of 1*s.* a quarter on corn was abolished as lately as 1870; and those on tea, sugar, and coffee have been greatly reduced within these few years back.

The revenue derived from customs in 1590 (under Elizabeth) was about £50,000; in 1613 it had increased to £148,075; in 1660, at the Restoration, to £421,582; and at the Revolution in 1688 to £781,987. During the war terminated by the Peace of Paris in 1763, the net produce of the customs revenue was nearly £2,000,000; in 1815, at the close of the war, it amounted to £11,360,000; and for the year ending March, 1873, to £20,976,236.

CUSTOS ROTULORUM, an officer in England who has the custody of the rolls and records of the sessions of the peace, and also of the commission of the peace itself. He is usually a nobleman, and always a justice of the peace, of the quorum in the county where he is appointed. He may execute his office by a deputy, and is empowered to appoint the clerk of the peace; but he is prohibited from selling his office under divers penalties.

CUSTRIN. See KÜSTRIN.

CUTCH, a province of Hindustan, between lat. 22° 45′ and 24° 40′ N., and lon. 68° 40′ and 71° 20′ E.; length, east to west, about 160; breadth, 110 miles. During the rainy season it is wholly insulated by water, and at all times is connected with the mainland by a comparatively narrow tract, as it has the Arabian Sea on the west, the Gulf of Cutch on the south, and the vast salt morass of the Runn on the north. There are no large rivers, and the streams getting dried up during the dry season might occasion a fatal scarcity of water; but a good supply is easily obtained by boring the rock underlying the more recent formations. The whole country has been subjected to violent volcanic action. A ridge with conical peaks traverses the province from east to west, and as late as 1819 a violent earthquake produced great geological changes, and converted Bhooj, the principal town, into a heap of ruins. The only fruit which thrives well is the date: the principal exports are cotton and horses. The latter have long been esteemed. The province cannot raise grain enough to supply its inhabitants. The remarkable region called the Runn of Cutch appears to have been once an inland sea. It covers about 7000 square miles, and is dry during the greater part of the year; but during the monsoons, when the sea runs high, the water forces its way up the gulf, and the greater part of the Runn is submerged. After evaporation an incrustation of salt, about an inch thick, often remains. Pop. of the province over 500,000.

CUTCH GUNDAVA, a division of Beloochistan, occupying a north-east projection, in a great measure separated from the rest of the country by the mountain range of Hala. It lies between lat. 27° 40′ and 29° 50′ N., and lon. 67° 20′ and 69° 17′ E.; stretches 160 miles from north to south, with a breadth of about 130 miles, and has an area of 10,000 square miles, and a population of 100,000. Its principal characteristics are its large extent of level surface, the excessive sultriness of its climate, and the scarcity of water. Where irrigated it yields grain, pulse, cotton, sugar, madder, and fruits. It is also of some commercial importance, being traversed by the principal routes between Scinde and Afghanistan. The inhabitants belong to the three distinct races of Jets, considered the aborigines, Rinds, and Brahuis. They are almost all Sunni Mohammedans. The principal towns are Gundava, the capital, Dadur, Bhag, Lehree, and Kotree.

CUTHBERT, ST., one of the most celebrated fathers of the early English church, was born, according to the tradition, near Melrose about 635. He is said to have been descended from one of the petty kings of Ireland. While yet a young man and tending his father's sheep on the heights of Lauderdale, he saw a company of angels descend on the monastery of Lindisfarne, then returning heavenwards, carrying with them the soul of the good St. Aidan. This vision determined his future career; he became a monk. In 664 he was appointed prior of Melrose, and soon after was transferred to the charge of the monastery of Lindisfarne (or the Holy Island). The comparative comfort and indulgence of this large establishment shocked the ascetic tastes of St. Cuthbert, and in a few years he retired to the desolate Isle of Farne, where he might enjoy a life of solitude. This barren island was soon transformed, by the activity of the hermit, aided by miraculous agency, into a fruitful paradise. The fame of his holiness attracted many visitors, among others Elfleda, daughter of King Oswy. At last, much against his inclination, he accepted, upon the persuasions of King Ecgfrid of Northumbria and other great men of the north, the bishopric of Hexham, which he soon exchanged for that of Lindisfarne. Still thirsting after solitude he resigned this charge at the close of two years, and again retired to his hermitage in the Island of Farne. Here he died on the 20th March, 687. His body, buried at his request in the monastery of Lindisfarne, was exhumed eleven years later, when, according to Bede, it was found to be undecayed. Compelled to seek a refuge further inland from the fury of the Danes, the pious monks carried the sacred remains with them wherever they went. At last they found a final resting-place in the cathedral of Durham (4th September, 995). The anniversary of his death was a great festival in the English Church, which also commemorated the anniversary of the day on which his bones were deposited in Durham Cathedral. Pilgrimages were made to his shrine, as they were to the shrine of St. Thomas à Becket at Canterbury. Diseases of the eye or palsy were cured by a sight of his relics or kneeling at his tomb. A cloth which he used in celebrating mass was fashioned into a standard, and borne by the English army, who devoutly believed it insured victory. It waved o'er Flodden and the English were victorious. At the Reformation it was burned by Calvin's sister, wife of the first Protestant dean of the cathedral.

CUTICLE (from *cuticula*, the Latin diminutive of *cutis*, skin) is a thin, pellucid, insensible membrane, of a white colour, that covers and defends the true skin, with which it is connected by the hairs, exhaling and inhaling vessels, and the *rete mucosum*.

CUTLASS, a short sword used by seamen. The art of fencing with it is different from that with the small sword or broad sword. A guard over the hand is an advantage. It is, if well understood, a very effectual weapon in close contest: on account of its shortness it can be handled easily, and yet is long enough to protect a skilful swordsman.

CUTLERY is a term applied to all cutting instruments made of steel. Sharp-edged implements were made in ancient times of various hard stones, such as flint, or even of shells. The ancient Egyptians seem to have possessed the art of giving a hardness to bronze which adapted it to purposes for which only the best cast-steel is now found suitable. The Greeks appear to have become early acquainted with the properties of steel, and also the Romans to a greater or lesser extent. It never, however, seems to have superseded bronze, as the swords and surgical instruments found at Herculaneum and Pompeii were made of that material. In later times the swords of Damascus, Toledo, and Ferrara were noted for their excellency and exquisite beauty of workmanship. The cutlers of Sheffield had made themselves famous in the time of Chaucer, and this fame they have spread over the whole world, this town having no rival in fineness or quantity of work in any quarter of the globe.

Three kinds of steel are made use of in the manufacture of the different articles of cutlery; common, shear, and cast steel. The finer and highly polished articles, such as the best scissors, penknives, razors, and lancets are made of cast-steel. Table-knives, plane-irons, and chisels of a very superior kind are made of shear-steel, while common steel is wrought up into all the ordinary table cutlery, as also scythes, large scissors, &c.

To give the reader some idea of the mode of manufacturing cutlery, we shall describe the way in which a common razor is made. The workman, being furnished with a bar of cast-steel, forges his blade from it, using a forge similar to that of a smith. The brow of his anvil and his hammer being convex, enable him to give to the blade a degree of concavity which greatly facilitates and accelerates the subsequent work of grinding. The blade is then brought more exactly into shape by a file. It is exposed to a cherry-red heat, and instantly quenched in cold water. In this state the blade is extremely hard and requires to be tempered—a process generally performed by first brightening one side and then heating it over a fire free from flame and smoke, until the bright surface acquires a straw colour. It is again quenched, and is then ready for being ground. This method being liable, however, to several objections, a tempering bath with a thermometer has been suggested, and is used in this manner: a plate of steel finely polished is to be laid so as to float upon the surface of a bath of quicksilver, or of the fusible alloy of tin, lead, and bismuth; the bulb of a thermometer, graduated up to 600 degrees of Fahrenheit, is then to be plunged into the bath, which may be heated by the flame of a good argand-lamp. No change of colour will be visible on the polished steel until the mercury shall have risen to 430 degrees, and it will then be so faint as only to be perceptible when compared with a plate that has not been heated. This gives a hard and brittle temper suitable for lancets. At 450 degrees the colour will be a fine pale straw; giving the best temper for razors. As the heat increases the colour will become deeper, and succeeding changes will take place till heated up to the boiling-point of mercury. In this way one blade or 10,000 blades may be heated in the same bath, and after the first experiment it is unnecessary that the bath be metallic, as oil will answer the purpose equally well. As to the best cooling fluid, water at the temperature of about 40 degrees of Fahrenheit is found to answer as well as any other.

As to grinding and polishing the blade, this hardly requires much explanation. The diameter of the stone is chosen according to the degree of concavity required, and in polishing care is necessary to avoid heating the blade by friction, which would destroy its temper and render it useless. In preserving the surface from rust, the common blue mercurial ointment is sometimes used—or goose grease, or a solution of caoutchouc in ether, which last is employed by the engravers on steel to preserve their plates. Ethereal solutions of gold and chloride of platinum have been also used for the same purpose. The edge is given to surgical instruments by rubbing them on a fine German hone, moistened with oil.

As to lancets, it is necessary to finish their edge by rubbing them on a beautiful green stone, which is found to be the only material capable of giving perfect smoothness to these and other very delicate surgical instruments. The way of putting their points to the proof is to push them through a fine piece of leather; and if they pass through it with the most perfect facility, without the least resistance or sound being imparted to the senses of the operator, the edge is considered perfect. A minute alloy of nickel has been used also in making surgical instruments, that metal having been found to prevent the steel from being so very susceptible of rust as it otherwise is.

The beauty and elegance of polished steel is nowhere displayed to more advantage than in the manufacture of the finer kinds of scissors. The steel employed for the more valuable scissors should be cast-steel of the choicest qualities: it must possess hardness and unformity of texture, for the sake of assuming a fine polish; and great tenacity, when hot, for the purpose of forming the bow or ring of the scissors, which requires to be extended from a solid piece, having a hole previously punched through it. It ought also to be very tenacious when cold, to allow that delicacy of form observed in those scissors termed *ladies' scissors*. After the scissors are forged as near to the same size as the eye of the workman can ascertain, they are paired, and the two sides fitted together. The bows and some other parts are filed to their intended form; the blades are also roughly ground, and the two sides properly adjusted to each other, after being bound together with wire, and hardened up to the bows. They are afterwards heated till they become of a purple colour, which indicates their proper temper. Almost all the remaining part of the work is performed at the grinding-mill, with the stone, the lap, the polisher, and the brush. An ingenious device is introduced, by which the edges of the blades are brought into contact with each other only at the point where the cutting is effected, which point moves from the end next the pivot to the extremity of the blades, in the operation of closing them. This consists in giving a slightly bowed shape to the blades, and raising upon the inner surface of each, close behind the pivot, a little triangular prominence which makes the blades cant more and more toward each other as they are closed. This arrangement gives a certain degree of elasticity, which adds to the smooth action of the instrument. The coarser kinds of scissors may be obtained as low as 2½*d.* or 3½*d.* a dozen. The very large scissors are partly of iron and partly of steel, the shanks and bows being of the former. These, as well as those all of steel which are not hardened all over, cannot be polished: an inferior sort of lustre, however, is given to them by means of a burnish of hardened polished steel, which is very easily distinguished from

the real polish by the irregularity of the surface. See SWORD.

CUTTACK, a maritime district, Hindustan, lower provinces of Bengal; bounded E. by the Bay of Bengal; N.E. by Burdwan; W. by various petty native states, formerly tributary to the Nagpoor Mahrattas; and S.W. by the Northern Circars; extreme length, N.E. to S.W., 180 miles; extreme breadth, 110 miles; area, 7104 square miles. It is well watered, being intersected by the Mahanuddy, Braminy, Coyle, and smaller streams, all abounding with fish. During the dry season the minor streams dry up; but in the rainy season they swell to large rivers. A range of hills running parallel to, and at some distance from the coast, produces teak and other timber, which are floated down to the sea during the rainy season. The forests being extremely unhealthy can only be explored during April and May, when the noxious exhalations somewhat abate. Both the plains and hilly districts are infested with every species of wild animals, and a vast number of snakes and venomous reptiles. Rice, pulse, sugar, spices, and dye-stuffs are grown along the coast, which is low and marshy, and wheat and maize in the hilly regions. On the coast is extensively manufactured the best and whitest salt made in India. The chief towns are Cuttack, the capital, Balasore, and Pooree, near which is the temple of Jaggannatha, or Juggernaut. Population, 1,984,600.

CUTTACK (*Catak*, a royal residence), a town, Hindustan, capital of the above district, on the right bank of the Mahanuddy, 60 miles from its embouchure, and 230 S.S.W. Calcutta. It is straggling, but contains a number of good houses of hewn stone and brick, but mostly in very indifferent repair. The principal building is the Kuddum Russool in the suburbs; it has no pretensions to elegance of design, but contains a number of sacred relics. The only other building worthy of notice is the Jumma Musjid, situated in the principal street; it is also a clumsy building, and is used both as a school and place of prayer. The Hindu temples, with exception of an unfinished one, are all small and inelegant, and none are of any antiquity. The town has little trade; its chief manufactures are brass cooking utensils and shoes. Cuttack is protected from inundation by vast embankments faced with stone. The river during the rainy season is 1½ mile broad, and 38 or 40 feet deep; but during the dry season it is narrow, with a depth of only 3 feet. Cuttack is the most southern station in the Bengal presidency, and is esteemed exceedingly healthy, from being near the sea, and the absence of vegetation around it. About 1 mile northwest from Cuttack is the fort of Barahbattee, taken by the British in 1803. Pop. 40,000.

CUTTER, a small vessel, furnished with one mast, and a straight running bowsprit, which may be run in upon deck. It differs from the sloop in having no stay to support its jib. Many of these fast-sailing vessels were formerly used by smugglers, and were also employed for the purpose of apprehending them. In the latter case they were called *revenue cutters*.

CUTTLE-FISH. See CEPHALOPODA.

CUTTY-STOOL, a low stool, the stool of repentance, a seat formerly set apart in Scottish kirks, on which offenders against chastity were exhibited before the congregation and submitted to the minister's rebukes before they were readmitted to church privileges. This, which, notwithstanding the terror it inspired, seems not to have been very efficacious, gradually fell into desuetude, as somewhat repulsive to modern manners, and the rebuke is now administered in a semi-private way by the minister at the kirk-session.

CUT-WATER, the sharp part of the head of a ship below the beak, so called because it cuts or divides the water before it comes to the bow, that it may not come too suddenly to the breadth of the ship, which would retard it. It is an extension forwards of the beam at which the planking meets that covers the bow of the ship.

CUVIER, GEORGES LÉOPOLD CHRÉTIEN FRÉDÉRIC DAGOBERT, BARON, a distinguished modern naturalist, was born, August 23, 1769, at Montbéliard, then belonging to the duchy of Würtemberg. His father was an officer in a Swiss regiment in the French service. As the son's health was too feeble to allow him to become a soldier, he resolved to be a clergyman. He was obliged to pass an examination for the stipend, by the help of which he expected to study at Tübingen. A malicious examiner rejected him. The affair, however, was marked by so much injustice that Prince Frederick, brother of the duke, and governor of the district, thought it his duty to compensate Cuvier by a place in the Charles Academy at Stuttgart (March, 1784). Here he gave up his intention of becoming a clergyman. In Stuttgart he studied at first the science of law, though he was particularly fond of natural history. To this period of his life he was indebted for his accurate knowledge of the German language and literature. The narrow circumstances of his parents compelled him to accept at the age of nineteen the office of private instructor in the family of Count D'Héricy, in Normandy. Here he was at liberty to devote his leisure to natural science. Cuvier soon perceived that zoology was far from that perfection to which Linnæus had carried botany, and to which mineralogy had been carried by the united labours of the savants of Germany and France. The first desideratum was a careful observation of all the organs of animals, in order to ascertain their mutual dependence, and their influence on animal life; then a confutation of the fanciful systems which had obscured rather than illustrated the study. Examinations of the marine productions with which the neighbouring ocean abundantly supplied him served him as a suitable preparation. A natural classification of the Vermes or Worms (Linn.) was his first labour, and the clearness with which he gave an account of his observations and ingenious views procured him an acquaintance with the Abbé Tessier, who had taken refuge in Normandy during the Reign of Terror. The abbé soon discovered he had 'found a pearl in the mire of Normandy,' and put him in communication with the greatest naturalists of France. Geoffroy St. Hilaire invited him to Paris, opened to him the collections of natural history over which he presided, took part with him in the publication of several works on the classification of the Mammalia, and placed him at the Central School in Paris, May, 1795. The Institute, being re-established the same year, received him as a member of the first class. For the use of the Central School he wrote his Tableau Elémentaire de l'Histoire Naturelle des Animaux (1798), by which he laid the foundation of his future fame. From this time he was considered one of the first zoologists of Europe. He soon after displayed his brilliant talents as professor of comparative anatomy. His profound knowledge was not less remarkable than his elevated views, and the elegance with which he illustrated them before a mixed audience. In the lecture-room of the Lycée, where he lectured several years on natural history, was assembled all the accomplished society of Paris, attracted by the ingenuity of his classifications, and by his extensive surveys of all the kingdoms of nature.

In January, 1800, he justly received the place formerly occupied by D'Aubenton in the Collége de France. In 1803 Cuvier married Madame Duvau-

cel, widow of a fermier-général, who had perished on the scaffold in 1794. By this marriage he had four children, who all died before him. The last that he lamented was a daughter—a beautiful young lady who died when on the eve of marriage. His merits did not escape the sagacity of Napoleon. In the department of public instruction, in which one after another he filled the most important offices, he exercised much influence by his useful improvements and indefatigable activity. He delivered a report very honourable to Germany, in 1811, when he returned from a journey in Holland and Germany as superintendent of instruction. In 1813 the emperor appointed him *maître des requêtes* to the council of state, and committed to his care the most important affairs in Mentz. The same year, although a Protestant, he was commissioned with the organization of a new university at Rome, then in the hands of the French. Louis XVIII. confirmed him in his former offices, and raised him to the rank of counsellor. As such he belonged at first to the committee of legislation, and afterwards to that of the interior. The measures of the Abbé Frayssinous, then chancellor of the University of Paris, determined him to resign the office of university-counsellor, in December, 1822.

Notwithstanding his political engagements, Cuvier devoted himself continually to the study of natural history, which he has greatly extended by his discoveries. We mention only his Recherches sur les Ossemens Fossiles (1821–24; 3d edition, 1826, five vols. 4to, with plates—the classical introduction to this work is printed separately); Discours sur les Révolutions de la Surface du Globe, et sur les Changemens qu'elles ont produit dans le Règne Animal (3d edition, Paris, 1825); also, Le Règne Animal (1817, four volumes); Leçons d'Anatomie Comparée, Recueillies par Duméril et Duvernoy (1805, five vols.); Recherches Anatomiques sur les Reptiles Regardés Encore Comme Douteux (1807, 4to); Mémoires pour Servir à l'Histoire de l'Anatomie des Mollusques (1816, 4to). As perpetual secretary, &c., of the Academy, in the class of physical sciences, he pronounced *éloges* on the deceased members of the Institute. The Recueil d'Eloges Historiques (Paris, 1819, two volumes) contains models worthy of imitation. The French Academy received him, in consequence, among their forty members. Almost all the learned societies of the world sent him honorary diplomas. France is indebted to him for the establishment of a cabinet of comparative anatomy, which is the finest osteological collection in Europe.

Cuvier visited England twice, first in 1818 and afterwards in 1830, when he was honoured with a public dinner, given to him by a number of scientific and literary gentlemen. His death took place at Paris on the 13th May, 1832. Thin and feeble in his youth, by the time he arrived in Paris his health was seriously deranged, and his symptoms were those of incipient consumption; but a change in his habits, regular exercise on horseback, the excitement of new studies, and the exertion of lecturing worked such a change in him that he enjoyed good health until his last illness. His features were regular and handsome, the nose aquiline, the mouth marked with benevolence, the forehead most ample, and the eyes full of vivacity and sweetness. His brain was remarkably large, weighing nearly a pound more than the average human brain. As a man he was noble, generous, and open, accessible to the humblest of his pupils; as a politician pure and disinterested, although we cannot add liberal and enlightened.—His brother Frédéric (born 1773; died 1838) was also a naturalist of no mean order. In 1804 he was appointed to the direction of the menagerie in the Jardin des Plantes—a situation which enabled him to study the habits, instincts, and intelligence of animals; the results of his researches are given in his Histoire Naturelle des Mammifères.

CUXHAVEN, a village in Rützebüttel, a bailiwick of Hamburg, at the mouth of the river Elbe. The harbour is large and commodious, one of the safest on the coast, and is resorted to in cases of danger. Several new docks are in course of construction, of such depth as to receive the largest Atlantic liners. Should the Elbe continue to lose its depth, as it has been doing for these past forty years, Cuxhaven will likely rise into considerable commercial importance. Here vessels generally take pilots to go up the river to Hamburg, &c. These pilots are privileged, and by their statutes are compelled always to keep a yacht out at sea, near the outermost buoy, called the *red buoy*, with men ready to conduct any vessel which may demand assistance. These pilots very often go as far as the channel, and even through it, to meet vessels. The town contains no building of importance, and has about 1700 inhabitants.

CUYABA, or Jesus de Cuyaba, a town of Brazil, capital of Matto Grosso, on the river Cuyaba, nearly 300 miles above its entrance into Paraguay; 280 miles west of Villa Rica; pop., including suburbs, 11,000 to 12,000. In the neighbourhood of this town are the most western mining stations in Brazil, long celebrated for the quantity of gold they produce. The town is well provided with meat, fruits, and vegetables, and the surrounding country is fruitful.

CUZCO, an ancient city in Peru, capital of a department of the same name, is situated in a wide valley about 11,300 feet above sea-level, between the rivers Apurimac and Urubamba; lat. 13° 30′ 55″ s.; lon. 72° 4′ 10″ w. The houses are built of stone, covered with red tiles, and are of fine proportions, being many of them of the era of the Incas, and partaking of the peculiar and striking style of architecture practised by the Peruvians of that period. Amongst the principal architectural remains of its ancient grandeur are the fortress, the cathedral, and the convents of St. Augustine and La Merced, the latter three large buildings, and in design and workmanship inferior to few in the Old World. The fortress, which was erected by the Incas for the protection of their capital, the ruins of which stand upon a hill a little north from the city, is a stupendous specimen of cyclopean architecture, many of the stones employed in the structure being of the weight of 150 tons, and though of irregular shape, so nicely adjusted to each other that no mortar was required. Other objects of interest are the baths, the one of warm and the other of cold water; the ruins of a large stone way, which was built by order of the Incas, and which it is said reached as far as where Lima now stands, a distance of 400 miles; and the vestiges of some subterraneous passages which led to the fortress from the houses or palaces of the Inca. Cuzco has still a number of churches and convents, with several monasteries, collegiate schools, and a university, a library, a museum, and two hospitals. The inhabitants manufacture sugar, soap, cotton and woollen goods, leather, and parchment, and excel in embroidery, furniture carving, painting, and sculpture.

Cuzco is the most ancient of the Peruvian cities, and was at one time the capital of the empire of the Incas. It was founded, according to the common tradition, in 1043, by Manco Capac, the first Inca of Peru. In 1534 it was taken by Pizarro, who was surprised with the grandeur and magnificence it exhibited. Its streets were then large, wide, and straight; and its palaces and temples, the latter

including the famous Temple of the Sun, richly adorned with ornaments of gold and silver, which glittered on the walls. While still in possession of Pizarro it was besieged by the whole Peruvian force, and a great part of it destroyed. Pop. estimated by some at 60,000, but recent travellers think this too high a figure, and give 30,000 as being nearer the mark.

CYANOGEN. See PRUSSIC ACID.

CYANOMETER (*measurer of blue*) is the name of an instrument invented by Saussure for ascertaining the intensity of colour in the sky. It consists of a circular piece of metal or pasteboard, with a band, divided by radii into fifty-one portions, each of which is painted with a shade of blue, beginning with the deepest, not distinguishable from black, and decreasing gradually to the lightest, not distinguishable from white. It is used in the open air, and the observer holding it up between himself and that part of the air whose colour he wishes to ascertain, and in such a position as to secure its being strongly enlightened without receiving the direct rays of the sun, turns it gradually round on its own plane till he perceives an exact similarity between the tint of the instrument and the tint of the sky. The number of that particular tint as marked on the instrument marks the intensity of colour in the sky at that particular period.

CYANOSE, native sulphate of copper ($CuSO_4$, $5H_2O$), is met with generally in stalactitic or reniform masses, but sometimes in well-defined crystals. It is dark-blue, translucent, vitreous, brittle, readily soluble in water, and with a most disagreeable metallic taste. It is found in Cornwall, Anglesea, Wicklow, and in various parts of the Continent. Not unfrequently an aqueous solution of it is met with in mines where cupriferous iron pyrites is acted on by air and moisture so as to oxidize the metals and the sulphur. In these cases the blue copper waters are carefully collected, and the copper is precipitated by means of iron. Considerable quantities of the metal are thus gained.

CYBELE was originally a particular goddess of the Phrygians, like Isis, the symbol of the moon, and what is nearly connected with this, of the fruitfulness of the earth, for which reason she is confounded with Rhea, whose worship originated in Crete, and in whom personified nature was revered. When the worship of Cybele was introduced among the Greeks the goddess was already surrounded with a cloud of mythological traditions. According to Diodorus Cybele was the daughter of the Phrygian King Mæon and his wife Dindyma. At her birth her father, vexed that the child was not a boy, exposed her upon Mount Cybelus, where she was nursed by lions and panthers, and afterwards found and brought up by the wives of the herdsmen. She invented fifes and drums, with which she cured the diseases of beasts and children, became intimate with Marsyas, and fell violently in love with Atys. She was afterwards recognized and received by her parents. Her father discovering her love for Atys had him seized and executed, and left his body unburied. The grief of Cybele on this occasion deranged her understanding. She wandered about in search of Atys, with dishevelled hair, accompanied by the music of the drums and fifes which she had invented, through various countries, even to the Hyperboreans, the most distant inhabitants of the north. During her absence a famine arose in Phrygia, which did not cease until divine honours were paid to Cybele, by the command of the oracle, and the statue of Atys interred, as his body could not be found. Some traditions say that Atys, who had repelled her advances, and whom her magical arts had driven into a fit of insanity, emasculated himself. Other traditions give a different account of the cause of his misfortune. (See ATYS.) In memory of him the priests of Cybele were eunuchs. Her worship was celebrated with a violent noise of instruments, and rambling through fields and woods. In Crete she was confounded with Rhea. She was also blended with the old Latin goddess Ops. Her original statue was nothing but a dark quadrangular stone. Afterwards she was represented as a matron, with a mural crown on her head, in reference to the improved condition of men, arising from agriculture and their union into cities. A common attribute of the goddess is the vail about her head, which refers to the mysterious and incomprehensible in nature. In her right hand she often holds a staff, as an emblem of her power, and in her left a Phrygian drum. Sometimes a few ears of corn stand near her. The sun also is sometimes represented in her right hand, and the crescent of the moon in her left. We sometimes see her in a chariot drawn by lions; or else she sits upon a lion, and, as omnipotent nature, she holds a thunderbolt; or a lion lies near her. These symbols are all representations of her dominion and of the introduction of civilization by her means in the period of barbarism.

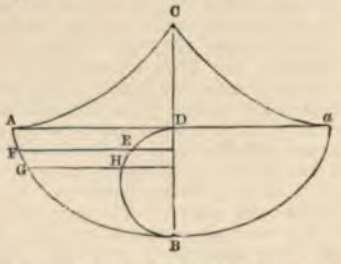
CYCLADES, or KYKLADES, the ancient and likewise the modern name given to the principal group of islands in the Grecian Archipelago, now belonging to the Kingdom of Greece, and formed into a separate nomos. They are said to have received their name from lying round the sacred island of Delos in a circle (Greek, *cyclos* or *kuklos*). The largest islands of the group are Andros, Paros, Myconos, Tenos, Naxos, Melos, and Thera or Santorin. They are situated between lat. 36° and 38° N., and lon. 24° and 26° 30′ E. They are generally mountainous, and evidently of volcanic formation. In several of them the soil, formed of decomposed lava, is of remarkable fertility, producing much barley, wine, olive-oil, and silk; in others the surface is almost sterile, and the principal products are sulphur and alum. The inhabitants are much addicted to a seafaring life, and have often distinguished themselves by their maritime prowess. United pop. estimated at 118,130.

CYCLE (Greek, *cyclos* or *kuklos*, a circle) is used for every uniformly returning succession of the same events. On such successions or cycles of years rests all chronology, particularly the calendar. Our common solar year, determined by the periodical return of the sun to the same point in the ecliptic, everybody knows contains fifty-two weeks and one day, and leap-year a day more. Consequently in different years the same day of the year cannot fall upon the same day of the week; as, for example, the year 1850 began with Tuesday, 1851 with Wednesday, 1852 with Thursday; but 1853, because preceded by a leap-year, began, not with Friday, but with Saturday. If we count only common years, it is manifest that from seven years to seven years every year would begin again with the same day of the week as the seventh year before; or, to express the same in other words, after seven years the dominical letter would return in the same order. But as every fourth year, instead of a common year, is a leap-year, this can only take place after 4×7, or twenty-eight years. Such a period of twenty-eight years is called a *solar cycle*, and serves to show the day of the week falling on the first day of January in every year. For this purpose it is only requisite to know with what day of the week a particular year began, and then to prepare a table for the first days of the twenty-seven following years. It is the custom now to fix the beginning of the solar cycle at the ninth year B.C., which was a leap-year, and began with Monday. If

you wish to know what day of the week the new-year's day of any year of our reckoning is, you have only to add nine to the number of the year, and then, after dividing this sum by twenty-eight, the quotient gives of course the number of complete cycles, and the remainder shows what year of the solar period the given year is, of which the table above mentioned gives the day of the week with which it begins. But this reckoning is only adapted to the Julian calendar. In the Gregorian it is interrupted by the circumstance that in 400 years the last year of the century is three times a common year. Hence this reckoning will not give the day of the week for the first day of the year; but from 1582 (the commencement of the Gregorian calendar) to 1700 for the 11th, from 1700 to 1800 for the 12th, in the nineteenth century for the 13th day of the year, and so on, from which we must then reckon back to the new-year's day. Hence it is far more convenient to prepare a table for the beginning of a century (for example, for 1801, which began with Thursday), and divide by 28 the number of years from that to the given year, and with the remainder seek in the table the day of the week for the first day of the year. Besides this another cycle is necessary for the determination of festival days, by the aid of which the feast of Easter, by which all the movable feasts are regulated, is to be reckoned. Easter depends on the first full moon after the vernal equinox (see CALENDAR). The lunar cycle is a period of nineteen years, after which the new moon falls again on the same day of the month. January 2, 1813, there was a new moon; January 2, 1832, there was a new moon again. As the time from one new moon to another, as astronomy teaches, is about 29½ days, a table of the new moons for nineteen years may be very easily prepared. It is only necessary to observe that this lunar cycle always begins with a year of which the first new moon falls on the 1st of January, and that this was the case the first year B.C. Divide by 19 the number of the year plus 1, and the remainder will show what year in the lunar period the given year is. The number of the year is called the *golden number*. Besides these two cycles, which are indispensable for the calculations of the calendar, there are some others, several of them known by the name of *periods*. See the accounts given under the heads CALENDAR and ÆRA.

CYCLIC POETS. See GREECE—Literature.

CYCLOID, the line described by any point in the rim of a wheel rolling along a straight line and in one plane.



Imagine a circle, D E H B, which is rolled along a straight line A D *a* in the plane of the circle itself till the point first at rest is brought to rest again, after an entire revolution. The curve A F G B *a* thus described by this point is called a *cycloid*. The circle D E B is called the *generating circle;* the line A D *a* on which it is described, the *base of the cycloid*. The length of the cycloid is four times the diameter of the generating circle, and its area three times the area of this circle. This line is very important in the higher branches of mechanics. Imagine a pendulum C B suspended by a thread in such a way that in the swinging of the pendulum between two cheeks C A, C A, each of which is bent in the form of a semicycloid equal to the semicycloid A F G B, the thread rolls and unrolls itself. Then the bob of the pendulum will describe the curve A F G B *a*, and the longest vibrations will be performed in the same time as the shortest, producing isochronism. The cycloid is hence called an *isochrone*. It is also called *brachystochrone* or *line of swiftest descent*, because it is the line in which a heavy body, falling in a direction oblique to the horizon, would pass in the shortest time between two points.

CYCLONE, or CIRCULAR STORM, a modern name applied to the hurricanes or tempests of the tropical and sub-tropical regions, which are distinguished from ordinary winds by their excessive violence as well as by the peculiarities of their origin and course, and are known by different names in different countries. In the West Indies they are called *hurricanes;* in Senegal, *tornados;* at the Cape of Good Hope, *trovados;* in the Chinese Sea, *typhoons;* and on the west coast of Central America, *papagallos*. The usual indication of their approach is the appearance of a small black cloud in the heavens, which rapidly enlarges and covers the face of the sky, so as to envelop everything in darkness. This is often accompanied with thunder and lightning, but the loudest thunder is soon drowned in the frightful howling of the tempest, which, breaking with all its violence, drives the sea mountains high, shatters the vessels in the harbours, and levels trees and houses with the ground. Cyclones are rotatory winds which have their origin between the tropics near the equator, and advance in the northern hemisphere from south-east to north-west, in the southern hemisphere from north-east to south-west; but as soon as they pass the limits of the temperate zone, turn almost at a right angle, and advance from south-west to north-east, and from north-west to south-east in the northern and southern hemispheres respectively. The rapidity with which they advance may sometimes be as high as 30 miles an hour, but in general is not more than 12 to 15 miles. Their stay at any one place is seldom more than twelve hours, and often only half an hour. In the West Indian waters hurricanes arise in the neighbourhood of the Little Antilles, between 10° and 20° N. lat., move towards the W.N.W., and at 30° N. lat. bend in a parabolic curve, and advance to the north-east, following pretty closely the coast of America. In the Indian Ocean they arise mostly in the neighbourhood of the islands of Rodriguez, Mauritius, and Madagascar; proceed towards the south-west, and then turn towards the south-east. The typhoons of the seas of Eastern Asia follow the same laws on the whole, but exhibit many peculiarities of their own.

CYCLOPÆDIA. See ENCYCLOPÆDIA.

CYCLOPEAN WORKS, in ancient architecture, masonry performed with huge blocks of stone unhewn and uncemented, much of which is to be seen in Sicily, said by the ignorant to be the works of an ancient and fabulous gigantic race of people; as Stonehenge is said by the country people to have been built by the devil. Some of these works called cyclopean were the walls of Argos, Tiryns, and Mycenæ; and similar walls are to be found in various parts of Greece and Italy. Near to Nauplia in Argolis there were caverns which, according to Strabo, were called cyclopean. Masonry of this kind is to be found at Persepolis and elsewhere in Asia, in the walls of Cuzco in Peru, and on a small scale

in the parish of Monifieth in Forfarshire. Staigue Fort in the county of Kerry, and the Grianan of Ailech in the county of Donegal, Ireland, may be mentioned as the other notable British specimens. See CYCLOPES.

CYCLOPES, the name of celebrated giants in the mythology of Greece. The earlier mythology makes them the sons of Uranus and Ge (Heaven and Earth). They belonged to the Titans, were three in number—Arges, Steropes, and Brontes—and had only one eye, situated in the middle of their forehead. They were cast into Tartarus by their father, and again by Cronus, but being released by Zeus in his war against Cronus and the Titans, they provided him with thunderbolts, and became his ministers. They were slain by Apollo for having furnished Zeus with thunderbolts to kill Asclepius (Æsculapius), Apollo's son. Wholly different from these are the sons of Neptune, of whom some enumerate seven, others nearly a hundred. The most distinguished of them is the Cyclops Polyphemus. With him is connected the whole nation of the Cyclopes, who are described in the Odyssey (ix. 106, et seq.) as wandering savages, uncouth giants, without agriculture or civil union, dwelling in mountain caves, and supporting themselves by the breeding of cattle. According to Homer they resided on the west side of Sicily. A later tradition describes the Cyclopes as the servants and assistants of Hephæstus (Vulcan), engaged in making the armour and metal ornaments for gods and heroes. Their number is indefinite. They are now represented as working under Ætna, or among the flaming crags of the Lipari Islands, volcanoes being looked upon as the workshops of Hephæstus. How they acquired the character of being one-eyed is unknown, as their name only attributes to them *round eyes*. Polyphemus in many figures is represented with two eyes. These three classes of Cyclopes are different from the people to whom a late tradition ascribed the erection of the gigantic stone-works called cyclopean. (See CYCLOPEAN WORKS.) The latter are represented as a Thracian tribe called Cyclopes from their king Cyclops, and why they were credited with such extraordinary architectural abilities is not known.

Cyclops is likewise a name which zoologists give to a certain minute aquatic animal having but one eye, situated in the middle of its forehead.

CYDER. See CIDER.

CYDNUS, a river in Cilicia, rising in the Taurus Mountains, flowed anciently through the city of Tarsus to the Mediterranean, and was celebrated for the clearness and coldness of its waters, which on one occasion are said to have nearly caused the death of Alexander the Great, by bathing in it when heated with exercise. The modern stream is choked up at its mouth by sand and alluvial deposits, so as only to leave room for the passage of a very small boat, but within the bar there is considerable depth of water, with a width of about 160 feet.

CYGNUS (the *Swan*), one of Ptolemy's northern constellations. Within this constellation is one of the richest portions of the Milky Way. It includes the double star Albireo, the components of which are differently coloured, one of them being orange and the other blue. The motions of the double star, 61 Cygni, have been carefully observed, and it has been estimated that the pair weigh together about one-third as much as our sun.

CYLINDER, the name of a geometrical solid formed by two parallel circular surfaces, called the superior base and the inferior base, and a convex surface terminated by them. There is a distinction between rectangular cylinders and oblique cylinders. In the first case, the axis, that is, the straight line joining the centre of the two opposite bases, must be perpendicular; in the second, the axis must form an angle with the inferior base. The solidity of a cylinder is equal to the product of the base by the altitude. Archimedes found that the solidity of a sphere inscribed in an equilateral cylinder, that is, of a sphere whose diameter is equal to the height and also to the diameter of the base of the cylinder, is equal to two-thirds of the solidity of the cylinder. The cylinder, hollow as well as solid, is constantly in use for the most various purposes.

CYLINDER GLASS. See GLASS.

CYLINDRICAL LENS, a lens whose surfaces are cylindrical instead of spherical, which is usually the case. A convex cylindrical lens brings the image of a source of light to a focus in a line instead of in a point. These lenses are employed in spectroscopes for examining star-spectra. They are usually *plano-cylindrical;* that is, cylindrical on one side and flat on the other.

CYMBALS, among the ancients, musical instruments, consisting of two hollow basins of brass, which emitted a ringing sound when struck together. The brazen instruments which are now used in military music, and have been borrowed by Europeans from the East, seem to have taken their rise from these. They were used in the worship of Cybele, Bacchus, Juno, and other deities.

CYME, an ancient city of Æolia, which, although styled by Strabo the largest and noblest of Æolian cities, is of little historical importance. It lay to the north of the Hermus (Sarabat), but as to its exact site nothing more is known than that it must have been near the modern Sanderli or Sandarlio. Hesiod is said to have been born here; but this is only an inference from a remark of the poet's that his father sailed from this place to settle at Ascra in Bœotia.

CYME, in botany, a mode of definite inflorescence in which the principal axis terminates in a flower, and a number of secondary axes rise from the primary, each of these terminating in a flower, while from these secondary axes others may arise terminating in the same way, and so on. In this mode of inflorescence all the flower-stalks rise to nearly the same height, so that they resemble a compressed panicle. Plants with opposite leaves are those in which this kind of inflorescence is mostly seen.

CYMRI, a branch of the Celtic family of nations which appears to have succeeded the Gaels in the great migration of the Celts westwards, and to have driven the Gaelic branch to the west (into Ireland and the Isle of Man) and to the north (into the Highlands of Scotland), while they themselves occupied the southern parts of Britain. At a later period (during the fifth and subsequent centuries) they were themselves driven out of the Lowlands of Britain by the invasions of German tribes, and compelled to take refuge in the mountainous regions of Wales, Cornwall, and the north-west of England. A part of them also crossed over into Gaul, and settled in Britain. Wales may now be regarded as the chief seat of the Cymri (a name which the Welsh still give to themselves), as it is still the chief place where the Cymric dialect of the Celtic language is spoken. A variety of this dialect, called the Cornish, was at one time spoken also in Cornwall, and another variety, called the Armorican, is still spoken in some parts of Brittany. On account of the similarity of the name the Cymri have been identified both with the Cimbri and the Cimmerii, but the identification is in both cases (assuredly in the latter) questionable. The origin of the name is unknown, various explanations being hazarded for it.

CYNICS. After the Greeks had explored, with unparalleled rapidity, all the regions of philosophy,

and sects of the most various kinds had formed themselves, it was not unnatural that a school should arise which condemned speculation, and devoted itself to the moral reformation of society. The Cynics were founded by Antisthenes, a scholar of Socrates, at Athens, about 380 B.C. This philosophy was a one-sided development of the Socratic teaching by Antisthenes and his followers, who looked only to the severer aspect of their master's doctrines, and did not see or did not rightly appreciate the way in which the seeming severity of the teaching of Socrates was corrected by the genial character of the man himself. An equally one-sided attention to the other aspect of the practical philosophy of Socrates, as exhibited in his own life, gave rise to the opposite teaching of Aristippus and his followers. There were, nevertheless, some noble features in the doctrines of the Cynics. They made virtue to consist in self-denial and independence of external circumstances, by which, as they thought, man assimilates himself to God. This simplicity of life, however, was soon carried so far by the Cynics that it degenerated into carelessness, and even neglect of decency. In their attempts at living conformably to nature they brought themselves down to the level of savages, and even of brutes. No wonder, then, that the Cynics soon became objects of contempt. The most famous of their number were, besides their founder, the ingenious zealot Diogenes of Sinope (412 to 323 B.C.), Crates of Thebes (about 328 B.C.), with his wife Hipparchia, and Menippus (about 60 B.C.), who was the last of them. After him this philosophy merged in the Stoic, a more worthy and honourable sect. See CYRENAICS.

CYNIPS (the Gall-fly), a genus of insects belonging to the order Hymenoptera, the family Pupivora, and the tribe Gallicolæ of Cuvier. They are a kind of small flies remarkable for their extremely minute head and large, elevated thorax. The females are provided with an ovipositor by which they make holes where they deposit their eggs in different parts of plants, thus producing those excrescences which are known as galls. In these excrescences the small larvæ are produced, which live there either singly or several of them together for five or six months, and consume the interior for their nourishment. Some of the species undergo their transformations before leaving the excrescences, others quit them and bury themselves in the earth, to undergo their transformations there. The *Cynips gallotinctoria* is of a pale fawn-colour, and lives on a species of oak which grows in the Levant, where it produces the so-called gall-nuts, which yield a black colouring matter, and are used in the making of ink. The *Cynips rosæ*, or bedeguar gall-fly, produces the hairy excrescences which are seen on the rose-bush and the sweet-briar. It is black, with the exception of the feet and the abdomen, which are red. The *Cynips psenes* (Linn.) is used in the Levant for caprification, an operation intended to hasten the maturity of figs. (See CAPRIFICATION.) Some species of gall-flies, such as the *Cynips fulviceps* and the *Cynips quercus-inferus*, have in some cases been produced from aphides instead of in the ordinary way from galls.

CYNOSARGES, in ancient Athens, originally the name of a sanctuary of Hercules and a gymnasium in the east of the city, afterwards extended to the suburb of Athens surrounding the gymnasium. It was in this gymnasium that Antisthenes, the founder of the Cynics, taught.

CYNOSCEPHALÆ (Greek, signifying dogs' heads), the name of a range of hills in Thessaly, memorable for two battles fought there in ancient times. The first was B.C. 364, between the Thebans and Alexander of Pheræ, in which Pelopidas was slain; and the second, B.C. 197, in which the last Philip of Macedon was defeated by the Roman consul Flamininus.

CYNOSURA, a nymph of Mount Ida who educated Jupiter, and was afterwards placed in the constellation of the Little Bear. By this star the Phœnicians directed their course in their voyages.—*Cynosure*, in a figurative sense, is hence used as synonymous with *pole-star* or *guide*. The word means dog's tail.

CYNTHIUS, a surname of Apollo, from Mount Cynthus, on the island of Delos, at the foot of which he had a temple, and on which he was born. Diana, his sister, is called Cynthia from the same mountain, because it was also her birth-place.

CYPERACEÆ, a natural order of monocotyledonous plants including fully 2000 known species. The members of this order are herbaceous plants, generally growing in moist places on the margins of lakes and streams. Their stem is a cylindrical or triangular culm with or without knots; the leaves are sheathing. The order comprises the genera *Carex*, *Scirpus*, *Cyperus*, *Schœnus*, *Mariscus*, *Papyrus*, and many others. They resemble the grasses, but are of little or no economical use, with the exception of papyrus, which furnished the ancient materials for paper.

CYPERUS, a genus of plants belonging to the family of the Cyperaceæ. The plants are herbaceous; the leaves narrow, and sheathing at the lower part; the flowers are in spikes, arranged in panicles or umbels, with imbricated scales; stamens three in number; pistil one, with three styles; the fruit is an irregular achene, sometimes compressed. The genus includes a large number of species, among which the papyrus was formerly reckoned; but this plant is now usually placed in a separate genus, *Papyrus*. The *Cyperus esculentus* grows in the south of Europe, in the more temperate parts of Africa, and in the East. Its creeping vivacious root, or more properly rhizome, bears on its branches a number of oblong or rounded tubercles about the size of a nut, which contain a considerable quantity of farinaceous matter, and have a pleasant sweet taste resembling that of chestnuts. This plant is cultivated in light damp soils for the sake of its tubercles, which are eaten like nuts or almonds. The *Cyperus longus* grows in ditches, on the banks of rivers, lakes, &c., and in marshes, in France and in the south of Europe. It is distinguished by its flowers being arranged in reddish spikelets on branching peduncles, and forming small umbels. Its long dark-coloured rhizome has a slightly bitter taste and an agreeable odour. Perfumers reduce it to powder and use it as a perfume. The *Cyperus rotundus* closely resembles the foregoing species, but its rhizome has a more harsh and bitter taste.

CYPRÆA. See COWRY.

CYPRESS. The cypress-tree (*Cupressus sempervirens*) is a dark-coloured evergreen, a native of the Levant, the leaves of which are extremely small, and entirely cover the slender branches, lying close upon them, so as to give them a somewhat quadrangular shape. In some of the trees the branches diminish gradually in length from the bottom to the top, in such a manner as to form a nearly pyramidal shape. In many of the old gardens in Europe cypress-trees are still to be found; but their generally sombre and gloomy appearance has caused them of late years to be much neglected. They are, however, very valuable, on account of their wood, which is hard, compact, and durable, of a pale or reddish colour, with deep veins, and a pleasant smell. We are informed by Pliny that the doors of the famous temple of Diana at Ephesus were of cypress wood, and though

400 years old at the time that he wrote, appeared to be nearly as fresh as when new. Indeed, this wood was so much esteemed by the ancients, that the image of Jupiter, in the capitol, was made of it. The gates of St. Peter's Church at Rome are stated to have been of cypress, and to have lasted more than 1000 years, from the time of the Emperor Constantine until that of Pope Eugenius IV., when gates of brass were erected in their stead. As this wood, in addition to its other qualities, takes a fine polish, and is not liable to the attacks of insects, it was formerly much esteemed for cabinet furniture. By the Greeks, in the time of Thucydides, it was used for the coffins of eminent warriors; and many of the chests which inclose Egyptian mummies are made of it. The latter afford very decisive proof of its almost incorruptible nature. The name of this tree is derived from the island of Cyprus, in the Mediterranean, where it still grows in great luxuriance. Its gloomy hue caused it to be consecrated by the ancients to Pluto, and to be used at the funerals of people of eminence. Pliny states that in his time it was customary to place branches of cypress-tree before those houses in which any person lay dead. Its perpetual verdure served the poets as the image of eternity, as its dark and silent leaf, unmoved by gentle breezes, is, perhaps, a proper symbol of melancholy. Large collections of cypresses, as they are often seen surrounding Turkish minarets, have a gloomy and interesting appearance. The oldest cypresses in Europe are undoubtedly those called *cipreses de la reina*, growing in a garden near Granada, in Spain, which are said to date from the middle of the fifteenth century. In the western parts of the United States, upon the Mississippi and other rivers, the cypress constitutes large forests of a most sombre and peculiar character. The dark, dense nature of their foliage, the shade, impenetrable to the sun, which they form, render them the fit abode of wild beasts and reptiles, and almost inaccessible to man. They cover tracts hundreds of miles in extent, and are visited only by the traveller and the woodcutter. Among the other members of the genus Cupressus are the Indian cypress (*Cupressus glauca*), a stately tree with wide-spreading foliage, often cultivated in Southern Spain and in Portugal; the *Cupressus pendula*, a fine tree with pendent branches, a native of China and Japan, where it is frequently planted above graves; and the incense-bearing cypress (*Cupressus thurifera*), a native of Mexico, from which there exudes an odoriferous resin used in that country for incense. The *Taxodium distichum*, which grows in Mexico, Carolina, and Virginia, is frequently called the Virginian cypress, although regarded by botanists as belonging to a different genus. For the White Cedar (*Cupressus thuyoides*), a member of this genus, see the article CEDAR.

CYPRIAN, Sr., born at Carthage about the beginning of the third century, was descended from a respectable family, and was a teacher of rhetoric there. About 246 he was converted to Christianity, when he distributed his property among the poor, and began to live in the greatest abstinence. The church in Carthage soon chose him presbyter, and in 248 he was made bishop. During the persecution under the Emperor Decius he fled, but constantly exhorted his church to continue firm in the Christian faith. In 255 he summoned a council at Carthage, to decide concerning those who had abandoned their faith during the persecution, but desired to be readmitted through penance. When the persecution of the Christians was renewed, A.D. 257, he was banished to Curubis, 12 leagues from Carthage. September 14, 258, he was beheaded at Carthage, because, in opposition to the orders of the government, he had preached the gospel in his gardens, near Carthage. Lactantius calls him one of the first eloquent Christian authors. The two best editions of his numerous works (which comprise a collection of eighty-one letters, affording valuable illustrations of the ecclesiastical history of his time) are those of Dr. Fell, bishop of Oxford, and Baluze, the former printed at Oxford in 1682, reprinted at Bremen in 1690, the latter (which was completed by a monk belonging to the Benedictine monastery of St. Maur) published at Paris in 1726.

CYPRIANS, a term used for courtesans, like that of Corinthians, because Venus was particularly worshipped in the island of Cyprus.

CYPRINIDÆ, a family of fishes belonging to the order Malacopteri or soft-finned fishes, and to the group Abdominalia. They are characterized by a small mouth; feeble jaws, often without teeth, with which, however, the pharynx is plentifully supplied; gill-rays few in number; body covered with scales; and no dorsal adipose fin, such as is possessed by the silures and the salmon. The members of this family are the least carnivorous of fishes. They include the carps, barbels, tenches, breams, loaches, the anableps, &c.

CYPRIS, a genus of entomostracous crustaceans, included by Cuvier in the order Branchiopoda, and the section Lophyropa, and belonging to the great genus Monoculus of Linnæus. The shell consists of two valves united by a fleshy hinge. They have six legs, but only four of these are ever seen out of the shell. The two antennæ have pencils of long hairs on their terminal joints, which by some naturalists are thought to serve merely as a kind of oars or paddles, while others are of opinion that they are organs of respiration. The Cypris is common in stagnant pools. It is very often found in a fossil state.

CYPRIS (*Cypria*), a surname of Venus, from the island of Cyprus, one of the principal seats of her worship.

CYPRUS (Turkish, *Kibris*), an island of Turkey in Asia, and the most eastern in the Mediterranean, near the mouth of the Bay or Gulf of Iskenderoon. It lies south-west and north-east, and is about 148 miles long, with a width, for 100 miles west to east, of about 40 miles; but its north-east extremity narrows greatly, and terminates in a long, narrow peninsula, about 40 miles long, and not over 15 miles broad; area, 3678 square miles. The whole island is occupied by a range of mountains stretching north-east to south-west, known in heathen mythology as the third range of Olympus, and whose culminating points, Santa Croce (Olympus) and Thrados, are 7000 feet high. Cyprus is deficient in water; its streams being chiefly mountain torrents, which dry up in summer, the only permanent river of importance being the Pedia (ancient *Pedæus*), which waters the valley of Nicosia, flows east, and falls into the sea at Famagosta. The climate is in general healthy, excepting in some points on the south coast during the heats of summer, much increased by the burning winds from the Arabian and African deserts, which, causing a rapid evaporation, give rise to a dangerous malaria. Temporary blindness is sometimes occasioned by the sun's reflection from the white chalky soil; and to avoid sunstroke, the natives wrap their heads in thick shawls.

The mountains of Cyprus are covered with forests of excellent building timber, and the island is esteemed the richest and most fertile in the Levant; yet it has few level tracts of country, those around Nicosia, Famagosta, Larnica, Limassol, and Baffa, being the chief. Agriculture, however, is in a very backward state, caused, in a great measure, by the oppressive exactions of the Turkish government, and

of the Greek priesthood. Fertile spots in the neighbourhood of the village are cultivated, but the more distant tracts are neglected. Of the vegetable products wheat, barley, cotton, tobacco, madder (after that of Smyrna the best in the Levant), and carobs are the most important. The carobs are exported chiefly to Odessa to be eaten by the Russian peasants during Lent. Cyprus is the native place of the cauliflower. Wine is the most noted production of the island. It is of five qualities: commanderie is the wine most sought after. It is grown near Limassol, near the site of the ancient commandery of the Knights of the Temple and of Malta. At first topaz-coloured, it becomes black when many years old, and is viscous, thick, strong, and an excellent stomachic. Muscat and morocanella are also excellent wines. The extensive pasture lands of the island support immense numbers of sheep and goats, which are annually exported to the value of £40,000. The minerals include talc, red jasper, copper (all of which are found in abundance), gold, silver, emeralds, and the Paphian diamond. The first three are the only minerals wrought. Salt, in large quantities, is obtained from salines at Limassol and Larnica. The Greek females of some of the towns and villages do beautiful embroidery, and make silk net, which will stand comparison with the finest European lace. The females also weave some common cotton, woollen, and linen fabrics—the last chiefly sacking. Good morocco leather is made at Nicosia; and calicoes, imported from Britain, are here dyed in brilliant colours, and exported to Syria, Smyrna, and Constantinople. Pottery, sufficient for home consumption, is made. The Cyprian ladies, so famous in antiquity, are handsomer, taller, and more stately than those of any other Grecian island. Their features are regular and dignified, exhibiting that elevated cast of countenance which is so universally admired in the works of Grecian artists. The island forms a government, of which the capital is Nicosia; which is also the seat of an archbishop belonging to the Greek church, and of an Armenian bishop. The principal ports, as well as the principal towns, are Cerina, Famagosta, Larnica, Limassol, and Baffa. Larnica is the residence of the consul. Pop. of the island, about 130,000.

The island of Cyprus is distinguished by remarkable places and mountains; as Paphos, Amathusia, Salamis, and Olympus, once adorned with a rich temple of Venus. Venus was particularly venerated here, because, according to tradition, the delightful shores of Cyprus received her when she emerged from the foam of the sea. The oldest history of this island is lost in the darkness of antiquity. When Amasis brought it under the Egyptian yoke, 550 B.C., Ionian and Phœnician colonists had formed several small states in the island. In 525 B.C. it was subdued by Cambyses and annexed to the Persian empire, but it again became a dependency of Egypt under Ptolemy Soter towards the end of the fourth century B.C. In this condition it remained till the year 57 B.C., when it was made a Roman province. After the division of the Roman territories Cyprus continued subject to the Eastern Empire. In 1182 Isaac Comnenus, a prince of the imperial family of Constantinople, made himself independent, but the island was wrested from him in 1191, during the third Crusade, by Richard I. of England, who afterwards bestowed it upon Guy of Lusignan on condition of his renouncing his claim to the title of King of Jerusalem. After the extinction of the legitimate male line of Lusignan, James, an illegitimate descendant, came to the government. His wife was a Venetian (Catharine Cornaro), and as she had no children at his death, the Venetians took advantage of this circumstance to make themselves masters of the island (1489). They enjoyed the undisturbed possession of it till 1571, when, in the reign of Selim II., notwithstanding the bravest resistance on the part of Marco Antonio Bragadino, who defended Famagosta eleven months, it was conquered by the Turks and annexed to the Ottoman Empire. In 1830 it was taken by the Viceroy of Egypt, but was retaken by the Turks in 1840, and since that time various changes have been introduced into the government of the island, tending much to the advantage of the inhabitants. In consequence of a claim made by the house of Savoy to the heirship of the Lusignan family, the King of Italy still bears the title of King of Cyprus.

CYPSELUS. See SWIFT.

CYR, ST., a French village in the department of the Seine-and-Oise, 1 league west of Versailles; famous for the seminary which Louis XIV. founded here, at the persuasion of Madame de Maintenon, in 1686. Here 250 noble ladies were educated, free of expense, until their twentieth year. Forty females of the order of St. Augustine instructed the scholars. Madame de Maintenon gave all her attention to this establishment. She is buried at St. Cyr. During the revolution this institution was overturned, but in 1806 Napoleon transferred to St. Cyr the military school which he had founded at Fontainebleau. Pop. of the commune, 2308.

CYRENAICA, once a powerful Greek state in the north of Africa, west of Egypt, comprising five cities (Pentapolis), among which was Cyrene, a Spartan colony. During the most flourishing period of the history of the city of Cyrene that town held in nominal subjection the whole extent of country lying between Carthage on the E., Egypt on the W., and Phazania (Fezzan) on the S., with the Mediterranean for its northern boundary, and the name of Cyrenaica was given to the whole of this tract. But the Greek colonists actually occupied no more than the highland district in the north, now called Jebel Akdar, along with the adjacent coast. Cyrenaica remained independent at first as a monarchy under a dynasty of kings, the successors of Battus, who led the first colony to Cyrene, afterwards as a republic, until it was subdued by Ptolemy, the son of Lagus, and annexed to Egypt B.C. 321 or 322. By the will of the last king of Cyrenaica belonging to the Ptolemaic dynasty, it was left to the Romans, B.C. 95, who, about twenty years later, erected it along with Crete into a Roman province. Under Constantine it was separated from Crete, and made a province by itself. Cyrenaica is at present a vast but almost unexplored field of antiquities. The antiquities there are described by the physician P. Della Cella, in his work Viaggio da Tripoli di Barbarie alle Frontiere Occidentali dell' Egitto, fatto nel 1817 (Genoa, 1819, 8vo). See also Pacho's Voyage dans la Cyrénaïque (1827); Barth's Wanderungen durch das Punische und Cyrenaïsche Küstenland (Berlin, 1849); and Messrs. Smith and Porcher's History of the Recent Discoveries at Cyrene (London, 1865). Of the famous inscription found among the ruins of Cyrene, and brought to Malta, some account has been given by Gesenius (Halle, 1825, 4to), and Hamacker, professor at Leyden (Leyden, 1825, 4to).

CYRENAICS, a philosophical sect, founded about 380 B.C., by Aristippus, a native of Cyrene, and a pupil of Socrates. The most distinguished of his followers were Antipater, Hegesias, Anniceris, and Theodore. See ARISTIPPUS and CYNICS.

CYRENE, in ancient times a celebrated city in Africa, about 10 miles from the north coast, founded by Battus and a body of Dorian colonists, B.C. 631. Numerous interesting remains have been discovered

here, including a bath, two temples (supposed to be of the Roman period), and a magnificent necropolis, containing grottoes, façades, and monuments of various kinds. In one of the grottoes are several curious paintings. Cyrene was the birth-place of Aristippus, Carneades, the philosopher, Eratosthenes, and Callimachus the grammarian. From an early period it was inhabited by numerous Jews. The town now occupying the site of the ancient Cyrene, called *Curen* or *Grenne*, is a miserable place in the regency of Tripolis, 1800 feet above sea level. See CYRENAICA.

CYRIL. Ecclesiastical history mentions three saints of this name.

1. CYRIL OF JERUSALEM, born there about the year 315, was ordained presbyter in 345, and after the death of St. Maximus became patriarch of Jerusalem. He engaged in a warm controversy with Acacius, the Arian bishop of Cæsarea. In addition to their dispute upon doctrinal points, Acacius accused him of having sold some valuable church ornaments, which he had indeed done, but for the laudable purpose of supporting the needy during a famine. A council assembled at Cæsarea by Acacius in 357, deposed Cyril; but the Council of Seleucia in 359 restored him and deposed his prosecutor. Acacius, by his artifices, succeeded in depriving him again of his dignity the next year, and after he had been once more recalled, he was a third time deposed by the Emperor Valens, after whose death he finally returned to Jerusalem. In 381 the Council of Constantinople confirmed him. He died in 386 or 388. We have twenty-three catecheses composed by him, in a clear and simple style, which are esteemed the oldest and best outline of the Christian dogmas (Paris, 1720, folio).

2. CYRIL OF ALEXANDRIA, was educated by his uncle Theophilus, patriarch of Alexandria; and spent five years in the monasteries of Nitria, where he was instructed by the abbot Serapion. He then went to Alexandria, where his graceful form and pleasing delivery gained him so many adherents, that after his uncle's death in 412 he succeeded him in the patriarchal dignity. Full of zeal and ambition, he was not satisfied with ecclesiastical honour alone, but exercised secular dominion also. To punish the Jews, by whom Christian blood had been shed during an insurrection, he assailed them at the head of the populace, destroyed their houses and their furniture, and drove them out of the city. Orestes, the prefect of Egypt, who complained of such lawless violence, so inconsistent with the character of a bishop, was soon after attacked in the streets by 500 furious monks, one of whom, having wounded Orestes, was apprehended, condemned to death, and expired under the blows of the lictors. Cyril caused his body to be carried in a solemn procession to the cathedral, gave him the name of *Thaumasius*, and extolled him as a martyr and a saint. The assassination of Hypatia, the learned daughter of Theon the mathematician, who had excited the envy of Cyril by the applause which she had gained by her knowledge of geometry and philosophy, took place at his instigation. Cyril contended long and violently against the doctrines of Nestorius, who distinguished between the divine and human nature of Christ, acknowledging Mary as the mother of Christ, but refusing to her the appellation of *mother of God*. He appealed to Pope Celestine I. as umpire, who immediately condemned them. He drew up twelve anathemas, directed against John, patriarch of Antioch, which, in the opinion even of theologians, are not wholly free from heresy, and called upon Nestorius to subscribe them. To settle the dispute between these two prelates, the council of Ephesus was summoned in 431. Both parties appeared with a great number of adherents and servants, between whom innumerable disputes arose. Cyril opened the council before the arrival of the patriarch of Antioch; and although Nestorius refused to recognize his enemies as judges, although sixty-eight bishops were in his favour, and a magistrate, in the name of the emperor, demanded a delay of four days; yet in a single day Nestorius was condemned, deposed, and declared to be a second Judas. Soon after the patriarch of Antioch arrived, and held a synod of fifty bishops, who, with equal haste, condemned Cyril as guilty of heresy, and declared him a monster born for the ruin of the church. Both parties rushed to arms: the streets of the city, and the cathedral itself, became the theatre of their fury, and were polluted with blood. The Emperor Theodosius sent troops to Ephesus to disperse this pugnacious council. This measure, however, only changed the theatre of the war; for it was continued three years longer between John of Antioch and Cyril. Soon after, Nestorius, not less violent than Cyril, obtained from the emperor a command for Cyril to appear again before a council at Ephesus. Both parties appeared with their adherents in arms. Cyril was maltreated and even imprisoned. He escaped from his keepers, however, and fled to Alexandria. From that place he contrived, by distributing bribes, to excite an insurrection in Constantinople, which struck terror into the timid emperor. Negotiations were begun: Cyril was prevailed upon to mitigate his anathema, and, against his will, to acknowledge a twofold nature in Christ. But Nestorius, as he was determined never to renounce his opinions, was compelled to lay down his offices and to retire to a monastery. He was afterwards banished to Thebais. Cyril closed his restless career in 444. His opinions prevailed both in the Eastern and Western Empire, and the church gave him a place among the saints. The best edition of his works, in which there is neither clearness nor accuracy of style, is that of 1638, in folio.

3. ST. CYRIL, 'the Apostle of the Slaves,' a native of Thessalonica, by way of distinction was called *Constantine*, and, at Constantinople, where he studied, received the name of the *Philosopher*. At the recommendation of St. Ignatius the emperor Michael III. sent him to the Chazars—a people of the stock of the Huns. He converted the khan, after whose example the whole nation were baptized. He then preached the gospel, with his brother Methodius, to the Bulgarians, about A.D. 860. They are also said to have preached in Moravia and Bohemia. Still later they went to Rome, where they both died. According to Dobrowsky Cyril died in 868; according to Xav. Richter he died in 871 or 872. The two apostles were both declared saints. He was the inventor of the Cyrillian Letters, which took their name from him, and is probably the author of the Apologies which bear his name.

CYRILLIAN LETTERS, characters called, in Slavonic, *Czuraliza;* one of the modes of writing the Slavonic language, of which there are three:—1. Roman or German letters, used by the people of Poland, Bohemia, and Lusatia. 2. *Cyrillian*, so called from their inventor St. Cyril. They are much used by the Russians. 3. From these Cyrillian characters, probably through the artifices of caligraphy, a peculiar alphabet was formed, which is sometimes used in printed books, but nowhere in common life.

CYRUS, King of Persia, a celebrated conqueror. The only ancient original authorities for the facts of his life are Herodotus and Ctesias. According to Herodotus he was the son of Cambyses, a distinguished Persian, and of Mandane, daughter of the Median King Astyages. He founded the Persian monarchy. A short time before his birth the soothsayers at the court of Astyages divined from a dream of his that his future grandson was to dethrone him.

Upon this he gave orders that Cyrus should be destroyed immediately after his birth. For this purpose he was delivered to a herdsman, who, moved with compassion, brought him up, and named him Cyrus. His courage and spirit betrayed his descent to the king. On one occasion, playing with other boys, and being chosen king by his companions, he caused the son of one of the first men in the nation to be beaten. The father of the boy complained to Astyages, who reprimanded young Cyrus; but he appealed to his right as king of his companions, and replied with so much boldness and good sense that Astyages became interested in him, and instituted inquiries, which led to the discovery of his birth. The Magi having succeeded in quieting the uneasiness which the discovery occasioned him, he sent Cyrus to his parents in Persia, with marks of his favour. But the young man soon drew together a formidable army of Persians, and conquered his grandfather (B.C. 559), and thus became King of Media and Persia. In 546 he conquered Crœsus, the rich and powerful King of Lydia, and in 538 he took Babylon after a siege of two years. He also subdued Phœnicia and Palestine, to which he caused the Jews to return from the Babylonish captivity. While Asia, from the Hellespont to the Indies, was under his dominion, he engaged in an unjust war against the Massagetæ—a people of Scythia, north-east of the Caspian Sea, beyond the Araxes, then ruled by a queen named Tomyris. In the first battle he conquered by stratagem, but in the second he experienced a total defeat, and was himself slain (B.C. 529). The stories related by Xenophon in the Cyropædia (Account of the Life and Remarkable Traits in the Character of Cyrus), that he received a splendid education at the court of Astyages, inherited his kingdom, and ruled like a genuine philosopher, are without doubt mere romance, deserving not the least historical credit, Xenophon's design being to represent the model of a king, without regard to historical truth, and in this way perhaps to exhibit to his countrymen the advantages of a monarchy. The chief points in which the account of Ctesias differs from that of Herodotus are that Ctesias does not make Cyrus any relation of Astyages whatever, that after the conquest of Media Cyrus married Amytis, the daughter of Astyages, and honoured the latter as a father, and that he met his death in a battle with a nation called the Derbices, who were assisted by the Indians. Ctesias also mentions certain wars of Cyrus not related by Herodotus, and gives a somewhat different account of the war with Crœsus, king of Lydia.

CYRUS, called the *Younger*, to distinguish him from Cyrus the founder of the Medo-Persian monarchy, was the second son of Darius Nothus, or Ochus. In the sixteenth year of his age he obtained the supreme power over all the provinces of Asia Minor. His ambition early displayed itself; and when, after his father's death (404 B.C.), his elder brother, Artaxerxes Mnemon, ascended the throne, Cyrus formed a conspiracy against him, which was, however, discovered before it came to maturity. Cyrus was arrested by his brother and condemned to death, but at the intercession of his mother Parysatis he was released, and made governor of Asia Minor. Here Cyrus assembled a numerous army to make war upon Artaxerxes and dethrone him. Among his forces were 13,000 Greek auxiliaries, who were ignorant, however, of the object of the expedition. Being informed of his brother's design, Artaxerxes marched against him with a much larger army. In the plains of Cunaxa, in the province of Babylon, the two armies encountered each other (B.C. 400). In the battle that ensued the troops of Cyrus were at first victorious, especially on the right, where his Greek auxiliaries were stationed, but the fruits of the victory were lost through the death of Cyrus himself in the battle. An account of the life of Cyrus is contained in the opening book of Xenophon's Anabasis, which gives a detailed account of the retreat of the Greek auxiliaries of Cyrus from the interior of Persia to the coast of Asia Minor.

CYTHERA. See CERIGO.

CYTISIN ($C_{20}H_{27}N_3O$). When the ripe seeds of laburnum are powdered, extracted with acidulated water, the fluid treated successively with lead acetate and tannic acid, and the precipitate, before it becomes resinous, mixed with lead oxide, then dried and exhausted with alcohol, crude cytisin is obtained on evaporation, which, after proper purification, forms a brilliant crystalline mass. It is very soluble in water and alcohol, but insoluble in ether, benzol, and chloroform, has a bitter taste, but no odour. It is a very powerful base, decomposing the salts of ammonia and the metals even in the cold. It combines with the strong acids, but the salts are all deliquescent except the nitrate, which crystallizes very readily in splendid, thick, transparent, colourless, monoclinic prisms. It can be sublimed without decomposition by careful heating in a current of hydrogen.

The poisonous properties of laburnum are well known, the seeds having been often swallowed in ignorance, and not unfrequently administered intentionally. The toxicological effects are due to this alkaloid, which in doses of from 0·1 to 0·5 of a grain is fatal in a few minutes to ordinary small animals. Mixed with much vegetable matter, as in the seeds, bark, or flowers, it is not rapidly fatal, but it produces lividness of the face, coldness over the whole body, sickness and difficulty of breathing, but even in this form a large enough bulk may be fatal.

CYTISUS, a genus of plants belonging to the natural order Leguminosæ, sub-order Papilionaceæ, distinguished by having a bilabiate calyx, with the upper lip generally entire, the lower lip somewhat three-toothed; vexillum broad and ovate, keel obtuse, including the stamens; legume compressed and containing a number of kidney-shaped seeds. The members of the genus are shrubs or small trees, sometimes spiny, with leaves composed of three leaflets, and with yellow, purple, or white flowers. They belong to Europe, Asia, and North Africa, and are very ornamental plants. The best known species is the common laburnum (*C. laburnum;* see LABURNUM), which is a native of Savoy and Switzerland. It is quite common in this country, and grows to the size of a considerable tree. Another species is the Alpine laburnum (*C. alpinus*). The common broom (*C. Scoparius*) also belongs to this genus. See BROOM.

CYZICUS, a peninsula of Asia Minor, 60 miles south-west of Constantinople. It projects into the Sea of Marmora, and is connected with the mainland by a narrow isthmus, but was once an island and the site of the ancient town of same name, which stood on its south extremity, and of which some remains, including a fine amphitheatre, are still seen. The peninsula, which stretches east to west for 18 miles, with a breadth of about 9 miles, is very beautiful and picturesque.

CZAR, ZAR, or ZAAR, a title of the autocrat of all the Russias. The word is derived from the Old Slavonic *czeszar*, which is itself not improbably a corruption of the Roman title Cæsar, although various other accounts are given of the origin of the word. Until the sixteenth century the rulers of the several Russian provinces were called *grand-princes* (*weliki-knaes*). Thus there were grand-princes of Wladimir, Kiev,

Moscow, &c. The grand-prince Wasilie was the first who received, in 1505, the title of *samodersheta*, which is equivalent to the Greek word *autocrat*. The son of Wasilie, Ivan IV., adopted the title of *czar* about the middle of the sixteenth century. In 1721 the senate and clergy conferred on Peter I., in the name of the nation, the title of *Emperor of Russia*, for which in Russia the Latin word *imperator* is used. Several European powers declined to acknowledge this title until the middle of the last century. The rulers of Georgia and Imeritia, now under the Russian sceptre, called themselves *czars*.

CZARTORYSKI, ADAM GEORGE, prince, a celebrated Polish statesman and patriot, born 14th Jan. 1770. His education was completed at the University of Edinburgh and in London. He displayed great courage in Kosciusko's struggle for the liberty of Poland; and after the partition of his country in 1795 he was sent as a hostage to St. Petersburg. There he formed a close friendship with Prince Alexander, who on his elevation to the throne appointed him minister of foreign affairs and curator of all the educational establishments in Poland. On April 11, 1805, he signed in name of Russia the Treaty of Alliance with Great Britain, after which he resigned his office. He was with Alexander at the battle of Austerlitz, and also accompanied him in the campaign of 1807. After the Peace of Tilsit he withdrew almost entirely from public affairs. After the outbreak of the war of 1812 we again find him in attendance on Alexander, whom he also accompanied to Paris in 1814. In 1817 he married the young and gifted Princess Anna Sapieta. On the outbreak of the Polish revolution of 1830 he showed himself active on behalf of his country, and was chosen president of the provisional government (Dec. 18). On 30th Jan. 1831, he became the head of the national government, and gave up the half of his property to the service of his country. On the appointment of Krukowiecki to the dictatorship Czartoryski resigned his post as president of the senate. In the last days of the struggle for freedom he served as a common soldier in the corps of General Romarino until the latter crossed over into Austrian territory, when Czartoryski also left Poland. Thenceforth he lived at Paris, ceaselessly engaged in aiding his needy fellow-countrymen. He was excluded from the amnesty of 1831, and his estates in Poland were confiscated. In 1848 he manumitted the serfs on his estate of Sieniawa in Galicia, and gave them their holdings as their own property. He died July 16, 1861, at Montfermeil, near Paris.

CZASLAU, a town, Bohemia, capital of a circle of same name, stands in a fertile plain, 45 miles E.S.E. of Prague, and is memorable for the defeat which the Austrians sustained from Frederick the Great in 1742. The deanery church has the loftiest steeple in Bohemia, and contains the remains of the celebrated Hussite leader, John Ziska. Population 5998.—The circle is well wooded and fertile, yielding excellent crops of corn and flax; and large quantities of minerals, more especially iron, are wrought. Pop. about 355,000.

CZECHS, the name applied to the most westerly branch of the great Slavonic family of races. The Czechs have their head-quarters in Bohemia, where they arrived in the second half of the sixth century, being pushed onwards by the Avares. Besides the Czechs, other tribes, such as the Dudlebi, Luczani, Sediczani, Pschowani, &c., are stated to have settled in the country under their leaders, but these were merely subdivisions of the Czechs. The descendants of these leaders appear in the ninth century as territorial princes. The origin of the name is unknown; the first author in whom we find it is the Russian chronicler Nestor. The total number of the Czechs (including Moravians, Slovaks, &c.) is about 6,000,000, nearly all of whom live in the Austrian Empire. The Czechs proper, in Bohemia, number about 2,700,000.

CZEGLED, a large market town, Hungary, county of Pesth, circle Ketskemet, on a plain between the Danube and Theiss, 39 miles S.E. of Pesth. There are some considerable breweries here. The land in the vicinity is well cultivated, and produces large quantities of grain and common red wine. Pop. in 1869, 22,216, mostly Protestant.

CZENSTOCHOW, or CZENSTOCHOWA, a town in Russian Poland, in the government of Lublin. It is divided into two towns, the old and new, not contiguous, but separated by Mount Klarenberg, the summit of which is crowned by a convent, which is fortified, and has stood several sieges. The old town, on the left bank of the Warta, was almost reduced to ashes in 1771. In the church of the convent of St. Paul, already mentioned, there is an image of the Virgin, which is visited by vast numbers of pilgrims. In 1665 a bloody battle was fought here between the army of the King of Poland and that of Prince Lubomirski. Pop. 14,167.

CZERNIGOV, a government of Russia, bounded on the N. by Mogilev, Smolensk, and Orel; on the E. by Orel and Koursk; on the S. by Poltava; and on the W. by Kiev, Minsk, and Mogilev; area, 20,243 square miles. The surface, with exception of a hilly district along the Dnieper, is a continuous flat, and the soil is almost unusually fertile. It is watered by numerous streams, the Dnieper flowing along at its west frontier, and the Desna, with its chief affluents, passing almost through its centre. It has also numerous lakes, though none are of great extent. All kinds of grain grow in abundance, but the crops often suffer greatly from hosts of locusts. Hemp, flax, tobacco, and the opium poppy grow well, and the gardens, in addition to the ordinary vegetables, produce hops, melons, &c. There is no deficiency of wood, either for timber or fuel. The horses of the government are of the Ukraine breed, small, but active, and capable of enduring any fatigue. The chief mineral produce is saltpetre, porcelain-earth, chalk, and a little iron. The distilling of brandy is carried on to a very great extent. The interior trade is almost confined to the four annual fairs, which are held at Niejin; the chief exports are, cattle, corn, brandy, honey, wax, and potash. Pop., almost all belonging to the Greek Church, 1,560,378.

CZERNIGOV, a town in Russia, capital of the government of the same name, situated on the right bank of the Desna, 80 miles N.N.E. Kiev. It is a place of great antiquity, and contains numerous buildings of antiquarian interest. Its ramparts have been converted into pleasing promenades. It is the seat of an archbishop, and has many churches—one of them, St. Sophia, supposed to have been founded in 1024—three monasteries, a gymnasium, and an orphan hospital. Three important annual fairs are held here. Pop. 17,096.

CZERNOWITZ, a city of Austria, in the duchy of Bukowina, 138 miles S.E. of Lemberg, situate on the slope of a hill, on the right bank of the Pruth. It contains several Greek churches, a Greek cathedral, a Roman Catholic church, a gymnasium, a philosophical academy, a head district school, a seminary, and an hospital. It is the seat of a Greek bishop, a Greek consistory, and of a court of justice. It has a considerable trade with Wallachia, Germany, &c., and has manufactures of clocks, silver-plate, carriages, toys, &c. Pop. 34,000, a considerable proportion being Jews.

CZERNY, or TCHERNY, a Slavonic prefix sometimes signifying *black*, and sometimes *tributary*, ap-

pearing in many geographical names, as Czernigov, Czernowitz.

CZERNY, GEORGE, hospodar of Servia, born in the neighbourhood of Belgrade about 1770; beheaded by the Turks, July, 1817. His true name was George Petrovitch, but he was called *Czerny* or *Kara George* on account of his dark colour, *Czerny* in Slavonic, and *Kara* in Turkish, signifying black. In 1788, as the leader of a Servian volunteer corps, he fought in the army of the Austrian General Loudon against the Turks, and in 1801 he returned to his native country and organized an insurrection with the view of delivering it from the Turkish yoke. He succeeded in driving the Turkish garrisons out of Servia, took the town of Belgrade, and compelled the Porte to recognize him as hospodar of Servia. When the Turks again invaded Servia, in 1813, he was compelled to retire before their superior forces, and took refuge first in Austria, and afterwards in Bessarabia. In 1817 he ventured to return to his native country, in the hope of inducing Milosh Obrenovitch, who had meanwhile received Servia as a vassal state from the Turks, to take part in a comprehensive scheme of rebellion; but Milosh betrayed him to the Pasha of Belgrade, who caused him to be assassinated.

CZERNY, KARL, a noted musical composer, was born in Vienna, 21st February, 1791, and was instructed in music by his father, a teacher of the pianoforte. He is the author of an immense number of pieces, which, from their brilliancy, were at one time extremely popular. Among his pupils were Liszt, Döhler, and other distinguished musicians. He died on 15th July, 1857.

CZIRKNITZ. See ZIRKNITZ.

D.

D, the fourth letter in our alphabet, of the order of mutes. According to M. Champollion, the *d* in the hieroglyphic writing of the old Egyptians, corresponding to the *dau* of the Copts, is a segment of a circle, similar to a ⌂. The Greek delta was a triangle, Δ, from which the Roman D has been borrowed. D, as an initial letter on medals, indicates the names of countries, cities, and persons, as *Decimus;* also the words *devotus, designatus, divus, dominus,* &c.; D.M., *diis manibus;* D.O.M., *Deo optimo maximo.* The Greek Δ represented the number four. Among Roman numerals, D signifies 500, but was not used as a numerical designation until 1500 years after Christ. The Romans designated a thousand in this way,—CIↃ. The early printers, it is said, thought it best to express 500 by half the character of 1000, and therefore introduced IↃ, which soon grew into D. If a line was marked over it, it signified 5000. In inscriptions and manuscripts, D is very often found in the place of B and L; *des* for *les, dachrumæ* for *lachrumæ.* In dedications, D., thrice repeated, signifies *Dat, Donat, Dicat,* or *Dat, Dicat, Dedicat.* As an abbreviation of the jurists, D signifies the pandects (*Digesta*). D stands for *doctor* in M.D.; in D.T., *doctor of theology;* LL.D., *doctor of laws,* &c. D. on French coins signifies *Lyons.* In music, D designates the second note in the natural diatonic scale of C, to which Guido applied the monosyllable *re.*

DAB (*Platessa limanda*), a fish belonging to the family of the Pleuronectidæ, or flat-fishes, which comprises also the soles, turbots, halibuts, as well as the plaice and the flounder, which last two are included in the same genus with the dab. It is characterized by a prominent line between the eyes, which are rather large, a lateral line strongly curved above the pectoral fins, and especially by having rougher scales than the other members of the same genus. This last characteristic is that to which it owes its specific name, derived from the Latin *lima,* a file. It is of a pale, brownish colour, spotted with white on the side which it usually keeps uppermost when resting on the sea bottom, and white on the underside. It is common on the coasts of Britain and in the Mediterranean, and its flesh is more esteemed than that of the flounder, especially from the end of January to April, when it is in best condition.

DABCHICK. See GREBE.

DA CAPO (Italian, from the head or beginning), an expression written at the end of a movement, to acquaint the performer that he is to return to, and end with the first strain.

DACCA, a district of Hindustan, province of Bengal, between lat. 23° 12′ and 24° 17′ N., and lon. 90° 11′ and 90° 58′ E. It is one of the richest districts in India; and although containing more jungle and unoccupied land than any other district in the province, produces such quantities of rice as to be called the granary of Bengal. The surface is an uninterrupted flat, and is intersected by two of the largest rivers in the world—the Ganges and Brahmapootra—from whose periodical inundations its extraordinary fertility arises. The principal agricultural productions are rice, betel-nut, cotton, hemp, and sugar. Dacca was at one time as celebrated for its manufactures as for its fertility, particularly for its muslins, which were of singular delicacy and beauty. This branch of industry, however, has been wholly extinguished —500,000 weavers in these provinces having been thrown out of employment, mainly in consequence of the successful rivalry of British manufactures of the same description, but also in consequence of the annihilation of the native courts of India, and of native power and wealth generally. Dimities of various kinds and patterns, diapers, and damask linens are still manufactured to a considerable extent. There are a number of Hindu schools throughout the district, in which the rudiments of the Bengalese language are taught, with the principles of their religion and law. During the Mohammedan government, the Daccas were ruled by a *foujdar,* or commandant. The population (about 600,000) is composed of Hindus and Mohammedans, in about equal proportions. The principal towns are Dacca, Narraingunge, Soonergong, and Rajanagur.

DACCA, a large city, capital of the district of the same name, and for eighty years the capital of Bengal. It is situated on the northern bank of a deep and broad river called the Boor Gunga (Old Ganges), at the distance of 100 miles from the sea, and 150 miles north-east of Calcutta. In this city, or its vicinity, beautiful muslins were once manufactured, and exported to every part of the civilized world. It has still an extensive manufacture of shell bracelets, much worn by the Hindu women. Dacca is a seat of the Serampore Mission, the missionaries of which conduct religious services in English, Hindustanee, and Bengalee, and superintend an

extensive circle of schools. The city was formerly much more extensive than it is at present, and exhibited a degree of splendour to which it has now no pretensions, as the magnificent ruins of bridges, causeways, caravanseries, palaces, gardens, &c., sufficiently prove. Dacca is considered one of the healthiest and most pleasant stations in Bengal, being free from the violent heats experienced in other parts of the provinces. In this city is one of the four hospitals for the insane under the Bengal presidency, and a college maintained at the public expense, in which there is an average of about 340 students, mostly Hindus. Pop. about 67,000.

DACE (*Leuciscus vulgaris*), a small river fish belonging to the family of the Cyprinidæ, and closely allied to the roach. In the words of Izaak Walton, these two fishes 'be much of a kind in matter of feeding, cunning, goodness, and usually in size.' There are, however, the following distinctions between them:—The dace is longer and thinner than the roach; its head and upper part are of a dusky blue colour, while in the roach these parts are bluish-green or dusky-green; in both the colour passes over on the under side to a silvery white. In the roach again the dorsal and caudal fins are tinged with red, and the anal, pectoral, and ventral fins of a bright-red colour; while in the dace the dorsal and caudal are pale-brown, and the others are almost white, merely tinged with pale-red; and lastly, the dorsal fin of the dace begins a little behind the middle of the body, while that of the roach begins exactly midway between the nose and the base of the tail. This fish is common in our own rivers as well as in those of France, Germany, and Italy. It prefers deep clear streams with a gentle current. It is a gregarious fish, swimming in shoals.

DACIA, in ancient times, a district of uncertain limits to the north of the Danube, inhabited by the Daci or Getæ, afterwards a Roman province. For a long time the Daci were formidable enemies of the Romans, and during the reign of the Emperor Domitian obtained so great an advantage that the emperor was compelled to accede to a disgraceful peace. To wipe off this stain Trajan, the second emperor after Domitian, in the year 100 A.D. invaded the Dacian territory, and reduced the Dacian King Decebalus to accept humiliating terms of peace. These he soon broke; and Trajan entering Dacia a second time, again subdued it, and then erected it into a Roman province, 106 A.D. The boundaries of this province were on the N. the Mons Carpatus (Carpathian Mountains); on the E. the river Hierasus (supposed to be the Sereth); on the S. the Danube, which separated it from Mœsia; and on the W. the Tysia (Theiss). The Romans remained masters of this province till the reign of the Emperor Aurelian, when, in 274 A.D., they withdrew from the region to the north of the Danube, and assigned to the Roman colonists of Dacia a territory on the south of the Danube lying between Upper and Lower Mœsia, which was hence called Dacia Aureliani. The former Dacia was now successively overrun by the Goths, Huns, Gepidæ, and Avares. Since that time the history of this country, which then lost the name of Dacia, is to be sought for in that of the provinces of which it formerly consisted.

DACIER, ANDRÉ, a learned Frenchman, was born at Castres in Upper Languedoc, April 6, 1651, and studied at Saumur under Tanneguy Lefèvre, whose daughter Anne was associated in his studies. After the death of Lefèvre, in 1672, he went to Paris. The Duke of Montausier, to whom his learning was known, intrusted him with the editing of Pompeius Festus (*in usum delphini*). In 1683 he married Anne Lefèvre, the daughter of his former teacher; and two years after they both embraced the Catholic religion. They received from the king considerable pensions. In 1695 Dacier was elected a member of the Academy of Inscriptions and of the French Academy; of the latter he was afterwards perpetual secretary. The care of the cabinet in the Louvre was intrusted to him. He died Sept. 18, 1722. Dacier wrote several indifferent translations of the Greek and Latin authors. Besides the edition of Pompeius Festus and the Œuvres d'Horace, en Latin et en Français, with the Nouveaux Eclaircissemens sur les Œuvres d'Horace (ten vols. Paris, 1681–89), and the Nouvelle Traduction d'Horace with critical annotations, he prepared an edition of Valerius Flaccus, a translation of Marcus Antoninus, of Epictetus, of Aristotle's Art of Poetry, with annotations; of the Lives of Plutarch, of the Œdipus and Electra of Sophocles, of the works of Hippocrates, and of several dialogues of Plato.

DACIER, ANNE LEFÈVRE, wife of the preceding, born at Saumur in 1651. After the death of her learned father, who had instructed her and cultivated her talents, she went to Paris, where she displayed her learning by an edition of Callimachus, which she inscribed to Huet, the under-tutor of the dauphin. The Duke of Montausier in consequence intrusted her with the care of several editions of the classics (*in usum delphini*), among them Florus, Aurelius Victor, and Eutropius. Her learned works were not interrupted by her marriage, which took place in 1683. Her feeble translation of Homer attracted a good deal of attention, and led to a dispute between her and Lamotte, in which it appeared that Madame Dacier understood much less of logic than Lamotte of the Greek language. In her Considérations sur les Causes de la Corruption du Goût she defended Homer with the acuteness of a profound commentator, and Lamotte replied with a great deal of wit and elegance; on which account it was said Lamotte wrote like an ingenious woman, Madame Dacier like a learned man. In her Homère Défendu she showed little mercy to Hardouin, who had written a satirical eulogy of this poet. On this occasion she was said to have uttered more invectives against the reviler of Homer than the poet himself had placed in the mouths of all his heroes. She translated Terence and three pieces of Plautus, in the prologue of which she treats of the origin, the cultivation, and changes of dramatic poetry with acuteness. Her translation of the Plutus and the Clouds of Aristophanes deserves indulgence as the first translation of the Greek comic poet. Her translation of Anacreon and Sappho, with a defence of the latter, met with success. She also wrote annotations on the Bible, but did not publish them. Her life was entirely devoted to literature and her domestic duties. She died Aug. 17, 1720. Equally estimable for her character and her talents, she gained as many admirers by her virtue, constancy, and equanimity, as by her works. She was member of several learned academies.

DACTYLE, in Greek and Roman versification, a foot consisting of one long followed by two short syllables. In the following line, for example,

Tityre | tu patu | lae recu | bans sub | tegmine | fagi,

the first, second, third, and fifth feet are dactyles. In modern hexameter verse a dactyle is represented by one accented and two unaccented syllables. The word is derived from the Greek *daktylos*, a finger, because a finger has one long and two short joints. See RHYTHM.

DACTYLIOMANCY (from *daktylios*, a ring, and *manteia*, divination), the pretended art of divining by means of rings.

DACTYLIOTHECA, a word derived from the Greek, and applied by the Romans to a collection of engraved gems. The art of engraving gems was nowhere carried to greater perfection than in Greece, where they were worn not only in rings (from which the name of *daktylios*, ring), but in seals, and were much used for other ornamental purposes. The Romans were far behind the Greeks in this art, but they were the first who made collections of precious stones. Scaurus, the son-in-law of Sulla, introduced the custom (Pliny, Hist. Nat. 37, 5). Pompey the Great transferred the collection of Mithridates to Rome, and placed it in the Capitol. A much larger collection was exhibited by Cæsar in the Temple of Venus Genitrix, and afterwards, under Augustus, by M. Marcellus in the Temple of Apollo Palatinus. In modern times the princes of Italy vied with each other in collecting these treasures of art. See GEM SCULPTURE.

DACTYLOLOGY, or DACTYLONOMY (from *daktylos*, the finger), is the art of numbering with the fingers, or, in a wider sense, of expressing one's thoughts in general with the fingers. It is usually taught in institutions for the education of the deaf and dumb.

DADO, in classical architecture, the middle part of a pedestal, that is to say, the solid rectangular part between the plinth and the cornice; also called the die. In the interior of houses it is applied to the skirting (usually of wood) which runs round the lower part of the walls to protect the plaster.

DADUCHUS (Latin; *Dadouchos*, Greek), literally a torch-bearer, but applied as an epithet to many of the ancient divinities, who were always represented as bearing a torch or flambeau. Daduchi were also those persons who, in certain ceremonies and religious processions, carried the flambeaus or sacred torches.

DÆDALA, or DÆDALEIA, the name given to full-length figures or images, with the feet in an advancing posture. But whence this appellation is derived is a contested point. The common opinion is that it was Dædalus who first separated the legs of the statues in an advancing posture, and that hence such statues were called Dædala. This also explains the saying that his statues moved, since all previous sculptors formed their statues with the arms hanging down, not divided from the body, and the legs not separated, like the mummy-shaped figures of the Egyptians.—Two festivals called Dædala (image-festival) were celebrated in Bœotia, mostly at Platææ. One was called the Great Dædala, which was celebrated once every sixty years by all the Bœotians, including the Platæans; the other, called the Lesser Dædala, was celebrated only by the inhabitants of Platææ.

DÆDALUS, a mythical Greek sculptor, the scene of most of whose labours is placed in Crete. According to the common account Dædalus lived three generations before the Trojan war (although he is mentioned in Homer only in one passage of doubtful interpretation), was distinguished for his talents in architecture, sculpture, and engraving, and as the inventor of many instruments; for instance, the axe, the saw, the plummet, the auger; also of glue, and masts and yards for ships. As a sculptor he wrought mostly in wood, and was the first who made the eyes of his statues open. This he did in Athens, which he was compelled to leave on account of the murder of his disciple Talos, of whose skill he was jealous. He built the famous labyrinth and a temple of Artemis Britomartis in Crete; executed for Ariadne a group of male and female dancers of white stone, and for Pasiphaë the notorious wooden cow. Being imprisoned with his son Icarus, he invented instruments for flying. The wings were fastened on with wax, which caused the death of Icarus, who flew too high, so that the heat of the sun melted the wax, and the wings dropped off; whence the Icarian Sea is said to have received its name. Dædalus himself reached Sicily, on the southern coast of which a place was called, after him, Dædalium. Böttiger supposes that Dædalus is not a proper name, but the common appellation of all the first architects, metallurgists, and sculptors in Grecian antiquity, being derived from the Greek *daidallein*, 'to work with skill.'

DAENDELS, HERMAN WILLEM, a Dutch general, was born in 1762, at Hattem, in Guelderland. He took an important part in the troubles which began in Holland in 1787, on the side of the patriots, and, with many of his countrymen of the same party, was compelled to take refuge in France, where he engaged in commercial speculations in Dunkirk. In 1793 he was appointed colonel of a corps of volunteers, called *Francs étrangers*, and was of great service to Dumouriez in his expedition against Holland. He rendered still greater services to Pichegru in the campaign of 1794–95, which made the French commander master of all Holland. Daendels now became lieutenant-general in the service of the Batavian Republic, and took an important part in the change of the government. When Louis Bonaparte ascended the throne he loaded him with honours, and appointed him governor-general of Batavia, an appointment which he held from 1808 to 1811. After the union of Holland with France Napoleon recalled him. Daendels arrived in Europe in the summer of 1812. He employed his leisure time in preparing an account of his government in Java (four vols. folio), in which he throws much light on the statistics and general condition of that country, and which was published in 1814, with the title Staat der Nederlandsche Oost-Indische Bezittingen in 1808–11. He was afterwards appointed by the King of the Netherlands to organize the restored colonies on the coast of Africa. Here he displayed his usual energy; he promoted peace between the neighbouring Negro states, encouraged the establishment of new plantations on the West India plan, and checked the slave-trade, until his death in 1818.

DAFFODIL. See NARCISSUS.

DAGGER, a weapon resembling a short sword, with a two-edged, sometimes three-cornered, sharp-pointed blade. In the feudal period it was carried by knights in addition to their sword; and in single combat it was wielded in the left hand, and used by them to parry the blows of their adversaries, and also to despatch a vanquished adversary, unless he begged for quarter, whence it was called the 'dagger of mercy.' The dagger is now chiefly used by assassins.—In printing, a dagger (†) is used for the second reference on a page.

DAGH, a Persian word, signifying *mountain*.—Daghestan, *land of mountains*.

DAGHESTAN, a division of the viceroyalty of Caucasian Russia, stretching along the west side of the Caspian Sea, between lat. 41° 54′ and 44° N.; and lon. 45° 40′ and 48° 30′ E., having Tshetshen Island at its N.W. extremity and the most northerly mouth of the Samur at the S.E.; area, 11,036 square miles. The capital is Derbent. Towards the shores of the Caspian it spreads out into plains, but as it recedes becomes covered with offsets of the Caucasus, which traverse it in a S.E. direction by lofty ridges, separated by deep valleys, which are fertile and tolerably cultivated, producing good crops of grain, and also silk, cotton, madder, flax, saffron, and tobacco. The inhabitants, almost all professed Mohammedans, consist chiefly of races of Tartar origin and of various Circassian tribes. They speak various dialects of the

Tartar tongue, mixed with Armenian, Persian, and Hebrew. Pop. 449,096.

DÁGOBA, in Buddhist countries and those which at one time held the Buddhist faith, a conical erection containing relics. The word is said to be derived from *dá*, *dátu*, or *dhátu*, a relic, and *geba* or *garbha*, the womb. They are built of brick or stone, are circular in form, and are erected on natural or artificial mounds, while the stone or brick structure itself sometimes rises to an immense height. The contents of a dágoba usually consist of stone or metallic vessels of various shapes and sizes. One of the articles is usually a silver casket, with a gold casket, often highly wrought with chased work on the surface, and set with precious stones, and this second casket is either inclosed in the first or lying beside it with the rest of the objects. Some of the smaller articles, such as pearls, gold buttons, rings, beads, &c., are sometimes contained in these caskets, which are in some cases scratched on the surface with a peculiar character. These dágobas have always been held in the highest veneration by the Buddhists, and a common mode of testifying their veneration is to walk round them, repeating prayers the while. A legend connected with the early history of Ceylon strikingly illustrates the degree of reverence which is paid to these structures. It is said that Elaro, a king of Ceylon who reigned about the end of the third century B.C., on one occasion while riding out in his carriage accidentally allowed the yoke-bar to come in contact with a dágoba, which caused the displacement of a few of the stones. The priests at once reproached him for the act, unintentional as it was; whereupon the king, descending from his carriage, prostrated himself on the ground, and cried out that they might take off his head with the wheel of his carriage. The priests, however, satisfied with this mark of piety and respect for the sacred edifice, replied, 'Great king, our divine teacher delights not in torture; repair the dágoba.' Some remarkable dágobas are to be seen at Anuradhapura, in Ceylon.

DAGOBERT I. (called the *Great* on account of his military successes), King of the Franks, of the Merovingian race, born about 600, in 628 succeeded his father, Clothaire II., who had reunited the divided members of the Frankish Empire. He waged war with success against the Slavonians, Gascons, and Bretons; but he stained the splendour of his victories by cruelty, violence, and licentiousness. After he had conquered the Saxons, it is said that he caused all those whose stature exceeded the length of his sword to be put to death. He deserves praise for his improvement of the laws of the Franks. He died at Épinay, 638, and was buried in St. Denis, which he had founded six years before.

DAGÖE, or DAGDEN, an island belonging to Russia, to the S.W. of the entrance of the Gulf of Finland, and opposite to Öesel, from which it is separated by the Sele Sund. It is not fertile, but has tolerable pastures and productive fisheries. The inhabitants, almost all Swedes, are about 10,000.

DAGON, the god of the Philistines, whose image is generally believed to have been in the form of a triton or merman, with the upper part human and the extremities, from the waist downwards, in the shape of the tail of a fish. From this latter circumstance the name is derived, from the Hebrew *dag*, a fish. Dagon and his temple are mentioned in Scripture, more especially in 1 Sam. v. 4. Milton thus alludes to him in describing the infernal senate:—

'Next came one
Who mourned in earnest when the captive ark
Maimed his brute image, head and hands lopt off
In his own temple, on the grunsel edge,
Where he fell flat, and shamed his worshippers:
Dagon his name, sea-monster, upward man
And downward fish: yet had his temple high
Reared in Azotus, dreaded through the coast
Of Palestine, in Gath and Ascalon,
And Accaron and Gaza's frontier bounds.'

DAGUERRE, LOUIS JACQUES MANDÉ, was born in 1789 at Cormeilles, department Seine-et-Oise. He was at first a scene-painter at Paris, and by his original devices soon took a front place in the art. While engaged in this way, and in painting panoramic views, he discovered a method of representing moonlight, day and night, changes of season, and so on, by the proper illumination of a large transparent canvas painted on both sides. The pictures were first exhibited in Paris in 1822, and shortly afterwards in London, and the exhibition was continued by the inventors until 1839, in which year the exhibition-room was burned down. (See DIORAMA.) This same year, on the 19th August, his successful completion of photographic printing was announced to the Academy by Arago. As early as 1814, Nicéphore Niepce had directed his attention to photography, and in 1827 had delivered pictures on metal to the Royal Society. In 1826 he had been joined by Daguerre, and on Dec. 14, 1829, a formal agreement was made between them. Niepce died July 5, 1833, and had apparently before his death given up the hope of succeeding with a plate sensitized by iodine. Daguerre, however, persevered, and at length produced the method which has been since called *daguerreotype*. The method consists in exposing a silver plate, cleaned with extraordinary care, to the vapour of iodine until it acquires a golden colour, and then placing it in the camera obscura previously focussed, until the experimenter deems the action complete. The plate is next subjected in a box to vapour of mercury; this develops the picture, which is fixed by immersion in strong brine, or preferably in hyposulphite of sodium. After thorough washing and drying the picture is covered with glass to prevent its being rubbed off. The drawback to the process was the length of time the plate had to be exposed. Numerous improvements speedily followed, which reduced the time to a minute or two, and enabled portraits to be taken. When it was first announced, and the pictures were exhibited, the greatest interest and astonishment were excited. The process was examined and reported on by the French government, Daguerre was made an officer of the Legion of Honour, and an annuity of 6000 francs was settled on him, and one of 4000 on the son of Niepce. Daguerre still worked at his process after he had published it, and wrote two works on the subject. He was also the author of a paper on the phosphorescence of calcined sulphate of barium. He died July 10, 1851, at Petit-Brie, near Paris, where a monument has been erected to him. Daguerreotype is now completely out of use, its place having been taken by the collodion process.

D'AGUESSEAU. See AGUESSEAU.

DAHLGREN, JOHN A., an American naval commander, born in the state of Pennsylvania in 1810; died at Washington, July, 1870. In 1826 he entered the navy of the United States as a midshipman, in 1837 was advanced to the rank of lieutenant, and in 1855 to that of commander. From the year 1847 he was employed on ordnance duty, and invented the cannons which are called after him Dahlgren guns, besides contriving a more effective method of arming gunboats with 12 to 24 pounder howitzers, throwing canister-shot and shrapnel-shells. At the outbreak of the civil war he was commander of the naval station at Washington; in July, 1862, he undertook the supreme command of the South Atlantic squadron; and after the death of Admiral Foote in 1863 he was

appointed to the command of the fleet stationed before Charleston. He is the author of a Report on the 32-pounders (Washington, 1850); System of Boat Armament in the United States Navy (Washington, 1852 and 1856); and Shells and Shell-guns (Washington, 1856).

DAHLGREN GUNS, an improved kind of cannons invented by John A. Dahlgren, of the United States navy. Their chief peculiarity consists in their having less metal between the muzzle and the trunnions than ordinary cannons.

DAHLIA, the name of a genus of plants belonging to the natural order Compositæ, or compound flowers, sub-order Corymbiferæ, and having their native home in Mexico. They have been favourites in our flower-gardens for many years, and an immense number of varieties (as many as 2000) have been produced, all deriving their origin from *Dahlia coccinea* and *D. variabilis*. The root is perennial, composed of fascicles of tubers, which are oblong and tapering at each end, and about 6 inches in length. The flowers, by cultivation, have been made to assume a variety of colours. The roots are much eaten by the Mexicans, though the taste is not very agreeable. The plant is reproduced from the seed, or by the division of the roots, which is the most approved mode. It requires frequent watering. In autumn the roots should be taken out of the ground, covered with dry sand, and kept beyond the reach of frost during the winter. The dahlia was named after a Swedish botanist Dahl.

DAHLIN, the name given to INULIN (which see) obtained from the pounded tubers of the dahlia. The juice is pressed from the tubers, clarified by standing, mixed with an equal bulk of strong alcohol, filtered, and then with other two volumes of alcohol. Inulin precipitates, and is washed and dried. It is a white starchy powder, with distinct crystalline structure; it has no taste or smell, is hygroscopic, but sparingly soluble in water, until it passes into a non-crystalline modification. The tubers pounded and distilled with water yield a strongly-smelling, sweetish ethereal oil, which is heavier than water, but becomes buttery and semicrystalline in it. The tubers also contain a fixed oil and salts of organic acids. The colouring matter of the purple dahlia is very sensitive to acids, which turn it red, and to alkalies, which turn it green. When extracted by water or alcohol, and paper steeped in it, it forms Georgina paper, and is used as a chemical test instead of red and blue litmus paper.

The name *dahlia* has been given to a violet from aniline, as well as to another called French purple. This latter is a lichen colour, and is prepared in a manner somewhat similar to cudbear (which see). The lichen is digested in milk of lime, the liquid neutralized with hydrochloric acid, and filtered. The gelatinous precipitate is dissolved in boiling ammonia, and kept for three or four weeks at about 140° F. in excess of ammonia, and the purple solution precipitated with chloride of calcium. This lime lake is applied with oxalic acid, alum, and ammonia, by which an alumina lake is thrown down. This substance, when pure, is of a violet colour, and combines very readily with animal fibres.

DAHLMANN, FRIEDRICH CHRISTOPH, a distinguished historian of Germany, born at Wismar May 13, 1785, died December 5, 1860. He studied at Copenhagen and Halle, and after qualifying himself as an instructor in the former university in 1810, he began to apply himself especially to history. In 1812 he was appointed professor extraordinary of history at Kiel, and in 1815 he became secretary to the standing deputation of the clergy and the Ritterschaft of Schleswig-Holstein, when he allowed himself to be drawn into the arena of political discussion, and wrote pamphlets maintaining the rights of the German party in Denmark. As his attitude was displeasing to the government, he did not receive the advancement to which he thought he was entitled, and accordingly, in 1829, he accepted a call to fill the chair of political science in the university of Göttingen. There he continued his historical studies, but did not on that account altogether abandon the domain of politics. He contributed in great measure to the establishment of the constitution of Hanover in 1833, and was a vigorous advocate of liberal principles. When, in 1837, this constitution was suspended by the king, Ernst August, he resigned his chair along with six other professors, and retired first to Leipzig, afterwards to Jena. In 1842 he was appointed to the chair of history in the University of Bonn, where he gave himself up entirely to literary pursuits. The revolution of 1848 recalled him to public life. He was sent as a deputy to the diet of the confederation, and had a share in elaborating the constitution called that of the 'Seventeen.' Afterwards he became one of the most influential members of the National Assembly, and one of the chiefs of the constitutional or parliamentary party. He was afterwards a member of the Prussian chamber of deputies, in which he set himself with all his might to withstand the reactionary movement which followed the troubled period of 1848–49; but finding that all his efforts were vain, he finally renounced politics entirely, and devoted the remainder of his life to literature. He has left a large number of works, all characterized by great depth, an accurate understanding of the events he relates, and a thorough knowledge of men. Among these are his Quellenkunde der deutschen Geschichte (1830); Geschichte Dänemarks (1840–43); Geschichte der englischen Revolution (1844); and Geschichte der französischen Revolution (1845).

DAHOMEY, a kingdom of West Africa which became known in Europe early in the eighteenth century. The present extent of the kingdom is estimated by Captain Burton to be much less than was formerly supposed. He states that the northern frontier is the river Tevi, about 100 miles from the coast; on the north-east are the tribes of Yariba or Yoruba; on the north-west the Aja and other tribes, all of which, though liable to the assaults and ravages of the Dahomans, are practically independent. The extreme breadth of Dahomey thus does not exceed 50 miles, and it narrows towards the south, where it is not more than 25 or 30 miles; the area being about 4000 square miles, instead of 36,000, according to earlier computations. The population is likewise set down at the smaller total of 150,000, of whom Captain Burton estimates that four-fifths are women and children; and adds, 'The annual withdrawal of both sexes from industry to slave-hunting and the customs at the capital, the waste of reproduction in Amazons (the female soldiers, who are compelled to celibacy), and the losses by disease and defeat, have made the country in parts a desert,' 'the population not being a third of what the land could support.' The soil is red and exceedingly fertile, but agriculture is despised, slaves being employed in it; the women, however, are the chief labourers, and cultivate their land with some degree of skill. The oil-palm might be a much greater source of wealth than it is, and the roads to the coast are generally good enough for wheeled carriages. The capital is Abomey, or Agbomey, at which the king principally resides, having a second palace at the village or town of Cannah, about 7 miles south of it; but according to Mr. J. A. Sketchly, who visited Dahomey in 1873, when he was the guest of the king, Abomey can scarcely be

regarded as a town at all, but is merely one of the king's palaces, with official residences for his high officers and servants. Whydah is the seaport. The people are of a warlike and aggressive character, engendered, no doubt, by their implication in the slave-trade. Incursions are frequently made by them upon neighbouring tribes, and the captives seized in these marauding expeditions are either sold to the traders, or are reserved, with condemned criminals, for the king's annual 'customs,' or human sacrifices, which are alleged by Captain Burton to have a *quasi* pious object, namely, the furnishing the spirits of his deceased father and other ancestors with the requisite attendants in the shades below. In December, 1863, a special mission was despatched by the British government to Agbomey, to make representations to the king with a view of inducing him to repress the traffic in slaves, and to modify, if not discontinue, the barbarities of the customs, and also to represent to him the advantages he would derive from establishing a legitimate trade with foreigners at Whydah; but no concessions were obtained. Mr. Sketchly, however, represents the present king as being more merciful than his predecessors, and desirous of reducing the number of those human sacrifices which the customs of the country impose on him.

DAILLÉ, JEAN, a distinguished Protestant divine, born at Châtelherault in 1594, after being educated at Poitiers and Saumur became tutor to the two grandsons of Duplessis-Mornay, and travelled with them over a large part of Europe. On his return he was ordained, and became pastor in 1625 of the church at Saumur, and in 1626 of that of Charenton at Paris, where he passed the remainder of his life. He died at Paris in 1670. He was one of the ablest and most learned divines of his day, and did essential service to the Protestant cause by several works, among which the most celebrated is entitled Traité de l'emploi des SS. Pères pour le Jugement des Différends de la Religion (Geneva, 1632). It was also published in Latin and translated into English, and in both forms has had a very extensive circulation both here and on the Continent. Its object is to show that the authority of the fathers has been far too much overvalued, especially by Roman Catholics, and that the ignorance or inaccuracy apparent in almost all their works unfit them for the establishment of any doctrine not clearly laid down in Scripture. He also wrote distinct treatises on several of the leading points of controversy between Protestants and Roman Catholics. One of these against auricular confession is particularly valuable.

DAIMIEL, a town, Spain, New Castile, in the province of Ciudad Real, and 20 miles E.N.E. of the town of Ciudad Real, on the left bank of the Azuer; pop. 12,355. It is tolerably well built, and has four squares, one of which is formed by substantial edifices with porticoes and balconies. The principal buildings are two parish churches, the one Gothic the other Doric, and both surmounted by towers. The manufactures consist chiefly of linen and woollen fabrics, blond lace, &c.; and the trade, which, as well as the population, has made considerable progress in recent years, is in grain, cattle, wine, and wool, sent for the most part to Valencia and Madrid.

DAIMIOS, a class of feudal lords formerly existing in Japan, but now deprived of their privileges and jurisdiction. As long as their feudal possessions remained to them, they exercised in their own domains the rights of petty rulers, and eighteen of them were to all intents and purposes independent, a circumstance which greatly limited the power of the mikado, and formed a great hindrance to the career of progress and reform on which Japan has now entered. In order to centralize the power of the government a decree was issued on the 12th of August, 1871, by which the daimios were deprived of all rights of sovereignty, their districts incorporated with the imperial territories, and their troops handed over to the imperial government. At the same time a new constitution and organization were given to the state. A deliberative assembly, consisting of two chambers, was created, to which deputies were sent by the former feudal governments or districts of the daimios (Han); and the daimios themselves were made official governors of those districts which they previously held as feudal rulers, and were placed upon a salary hereditary in their families. The yearly sum allotted to the payment of their salaries is equal to one-tenth of their former income.

DAIR-EL-KAMAR, the chief town of the Druses, Syria, on a slope of Mount Lebanon, 12 miles south-east of Beyrout, with about 30,000 inhabitants. It is accessible only by two narrow paths, and was once a flourishing place, with important manufactures of gold and scarlet cloth, but is now greatly decayed. The only remarkable buildings are a large khan, a palace which formed the old serai of the Emir of Lebanon, a Maronite convent, and several churches.

DAIRY. Dairy farming has, in every age, and in almost every country, constituted a necessary and interesting department of industry. The conversion of milk into butter and cheese being, under certain circumstances, a spontaneous act, was, as might be supposed, a very early discovery; and the use of these substances as food was no doubt very common in the patriarchal and pastoral times. Thus we find Abraham entertaining his supernatural visitors with butter (*ghee*) when on their way to warn Lot of the impending destruction of the cities of the plain. Frequent mention is made, in other parts of the Bible, both of butter and cheese; from which it may be inferred that these were as common articles of manufacture and consumption in those early times as they are at present—the principal difference being that they were generally made from the milk of the camel, sheep, or goat, instead of from that of the cow. The history of dairy farming in Great Britain is understood to extend about 700 years back; but the notices are brief, and merely indicate the fact that such a system of rural economy then existed in some parts of England—the county of Cheshire being more particularly mentioned for the excellence of its cheese as early as the twelfth century. Hitherto the nature of the soil and climate of a country has determined, in a great measure, the choice between tillage and dairy husbandry; thus we find in moist low-lying districts, where rich natural pasturage abounds, that the attention of the farmer is generally directed to the dairy system, almost to the entire exclusion of tillage farming. This is particularly observable on the rich damp *polders* of Holland, the valdes of Gloucestershire, the flats of Cheshire, the meadows of Leicestershire; and also in the dripping climate of the west of Scotland, and many parts of Ireland. These districts, familiarly known as the 'dairy counties,' are the principal sources of the dairy produce, especially butter and cheese, consumed in the large cities of the United Kingdom. Still dairy farming is not, by any means, confined to these localities, but is practised by many extensive farmers wherever there is scope for carrying on their operations profitably. A mixed system of tillage and dairy farming, which combines the excellencies of both, has long been practised in some parts both of England and Scotland; and, viewed in its relation to increased production, it can scarcely fail to become more general, and sooner or later to supersede entirely the old dairy system, which has so long remained stationary, and admits of so little improvement.

Formerly it was almost the universal practice to pasture cows intended to furnish milk for dairy purposes in the open field; but since the beginning of the present century experiments in stall-feeding, which were first made by Mr. Curwen of Workington Hall, Cumberland, and by Mr. Harley of Glasgow, and afterwards by many others, have shown that the latter system is a most important improvement in the management of cows, and it is greatly recommended by those who have given it a fair trial, Where it is carried out in all the details of cleanliness, and regular and high feeding observed, the profit is beyond doubt much greater than can be obtained from out-door feeding. The greatest evil in house-feeding cows was found by Mr. Harley to consist in the liability of the animals to take sores in their feet and knees, and to obviate this, he recommends, where it is possible, that the cows should be turned out to a grass field a few hours every day for exercise. Where this is not practicable, the cows require to be fattened off on the first symptoms of diseased feet or legs.

For milk dairies cows are selected that yield abundantly; quality being less an object than quantity. In butter and cheese dairies, however, the richness of the milk is the principal point; and as it is not always that a cow which gives the greatest quantity of milk is the best for yielding butter and cheese, the dairyman should satisfy himself by repeated experiments on individual cows, whether those that yield most milk are, after all, the most profitable for his particular purpose. The cow-house should be roomy and well ventilated in order to insure the health of the animals; and this is of the greater importance when cows are kept much in the stalls. The feeding of cows is a very important point in dairy management. Regularity in feeding is indispensable; so much so, that cases might easily be adduced to prove that a greater quantity of milk is obtained by attention to this point, than with higher feeding not accompanied by this simple precaution. Experienced dairymen give it as their opinion, that any irregularity in the times of giving cows their food is invariably followed by a marked diminution in the quantity of milk yielded, and that this continues for some time, even after regularity has been resumed.

As to the breed of cows to be preferred for purely dairy purposes, the Ayrshire cow deserves the first place. In consequence of her small, symmetrical, and compact body, combined with a chest rather narrow than otherwise, and a capacious stomach, there is little waste, comparatively speaking, through the respiratory system; while at the same time there is very complete assimilation of the food, and thus she converts a large proportion of her food into milk. So remarkable is this fact, that all dairy farmers, who have any experience on the point, agree in stating, *that an Ayrshire cow generally gives a larger return of milk for the food consumed than a cow of any other breed.* The absolute quantity may not be so great, but it is obtained at a less cost; and this is the point upon which the question of profit depends.

The Jersey cow is remarkable for the richness of her milk; so much so, that two or three of this breed kept in large dairies very perceptibly improve the quality of the butter and cheese.

Short-horn cows are seldom good milkers, unless the climate and food are both very favourable, and, under most circumstances, they have a greater tendency to produce fat than milk. Mr. Harley tried them at the Willowbank Dairy, but he found that they were far less profitable than the Ayrshire breed. The short-horned cows gave as much milk as the Ayrshire, but they consumed considerably more food. For mixed arable and dairy farming, where young stock are reared, the most profitable in Scotland have been the Ayrshire, Fifeshire, and Angus breeds; or a first cross of one or other with the short-horns; and in England, a cross of the short-horns, or an animal of some second-rate breed, is usually preferred for dairy purposes. In Ireland the small Kerry cow is invaluable, and is in fact the only *native* breed worth preserving and improving for the sake of its milk-producing qualities.

With regard to the age at which a milch cow ceases to be profitable, it is considered by all dairy farmers that the younger the cow the richer is her milk. The second and third years are the most profitable, if both the quantity and quality of the milk be taken into account. Thus, supposing a cow to drop her first calf when she is three years old—the usual time, she will be in her prime the two following years; and if she continue to produce her calf in good season (from February to April), she is generally retained in the dairy until seven or eight years old, after which it is not considered advisable, for several reasons, to continue her longer in milk; first, because her milk is fast deteriorating in quality; secondly, she is becoming every year of less value to the grazier; and lastly, which is a point too frequently overlooked, it has been satisfactorily proved that an aged cow consumes much more food than a young one.

Cleanliness in every process connected with the management of milk and its products is of the first importance, and without it neither cheese nor butter making can be carried on so as to produce an article that will give satisfaction either to the dairy factor or consumer. No substance more easily receives and retains the odours and taste of putrescent matter than milk; and, from its chemical constitution, it is continually liable to run to acidity and putrescence when exposed to an atmosphere contaminated with the effluvium of any other substance undergoing the process of decomposition. The practice, too common in many places, of making a larder of a portion of the milk-house, cannot be too severely reprehended; and what is nearly as bad, the more common practice still of having a number of cheeses undergoing the process of drying on the shelves. It is utterly impossible to keep milk sweet, especially in summer and autumn, where such malpractices are committed; and at any time it cannot be otherwise than productive of the worst effects on the habits of the dairymaid, whose ideas of cleanliness can scarcely be expected to be very refined under such circumstances. Spilt milk should never be allowed to remain for a single instant longer than what is necessary for its removal. The liberal use of water (cold in summer and warm in winter) is always to be commended; and in rinsing the milk-dishes a little common washing-soda, dissolved in the water, will be found highly useful in destroying any taint of sourness they may have acquired, and which, if not removed, is very apt to cause the milk to get sour long before it would do so of its own accord. The utensils required in the dairy are principally the following: milk-pails, milk-strainers or sieves, milk-cowls, coolers or pans, milk-skeels or creaming-dishes, lading-dishes, skimming-dishes, cheese ladders, cheese-vats, cheese-presses, and churns. The best dishes for milk are such as are made either of glass, tin, tinned iron, or well-glazed earthenware. Wood, lead, and zinc are all objectionable—the first on account of the difficulty of keeping the dishes clean; and the two latter because they are liable to corrosion or decomposition from the action of the acid contained in milk. The more shallow the milk-basins are, the quicker will the cream rise, and the greater will be the quantity. In summer small basins are preferable, as they allow

the milk to cool more quickly to the proper temperature; and in winter large tin cisterns may be advantageously used, as the milk is longer of cooling down to that point at which the cream ceases to rise readily.

For removing from the milk the taste of the food on which the cows are fed, which, in the case of turnips or cabbages, is often very strong, several recipes have been given: To stir the milk for some time after it is drawn; to place it in vessels which have been washed with a dilute solution of saltpetre, and in which a little of the saltpetre may remain; or to add to every two gallons of milk, as it is drawn, a dessert-spoonful of a saturated solution of the nitre; to add to every gallon a table-spoonful of the clear solution of half an ounce of the chloride of lime in a gallon of water, have all been suggested. To feed the cows with the turnips immediately after milking, so that twelve hours elapse, in which the aroma may be got rid of in the animal itself, is also a plan recommended by some.

The following description of a well-appointed dairy will give a better idea of all that is necessary for the cleanliness and efficiency of dairy management than could be got from a mere enumeration of all the points to be attended to.

The dairy, in its perfect form, consists of a milk-room, a churning-room, a cheese-making room, a loft for drying and storing cheeses, and a scullery common to the three first-named apartments, in which the various vessels used in the different processes are washed. In a less perfect form the churning and cheese-making may be carried on in one apartment. The description which follows is of a dairy of the first class, but it is applicable also to one of the second class, so far as the parts described are common to both. The milk-room looks to the north, and its floor is sunk 3 feet below the level of the surface of the ground, but the soil is kept from touching the walls by a face-wall built round it at some little distance. The floor of the space between this face-wall and the wall of the building, as well as that of the milk-room itself, is formed of smooth flagstones, carefully jointed and dressed, and having a channel formed to convey the water to a drain-eye. The face-wall is a foot or two in height, and coped with turf, and the earth is mounded up to it. In the middle of the milk-room, running parallel to the long walls, there are two benches of polished stone, hollowed out so as to form large but shallow troughs, for holding the milk-dishes, which may be surrounded with hot or cold water as may be required. In the centre of each of these benches there may be a *jet d'eau* to cool the air in summer, and in winter the water may be heated. The benches may be supported by pillars; but as the space below is of very little use, and dirt is apt to accumulate there, it is better to build up four walls to support each bench, or to set up flagstones on edge, to inclose it all round down to the floor, and the floor should not be level, but should slope towards the wall, where a channel is formed to convey the water to the drain. The walls of the room and the ceiling should be smoothly plastered. In place of a cornice at the junction of the walls and ceiling, there should be a simple curve running them into each other; and the skirting, which should be of stone or slate, should be flush with the plaster, the object in both cases being to avoid any projection whereon dust or dirt may lodge. In place of a lathed and plastered ceiling it is better to substitute an arch of brick or stone, in the form of a semicircle, without any break at the springing. The windows of the milk-house should be double. The outer frame should fit into a rebate on the outer edge of the reveal, and should be covered with perforated zinc or wire-gauze. The inner frame should be fitted with sashes hung with pulleys and weights. At the end of the room under the windows, and close to the floor, there should be apertures for admitting air; and these should be fitted on the outside with frames covered with zinc or wire-gauze, and on the inside with shutters sliding in frames. In the ceiling there should be apertures for ventilation, communicating with a well-constructed flue carried up close to the flue of the boiler, but entirely separate from it, and provided with an independent shaft. To guard against the possibility of any smoke being driven or drawn into the milk-house, the apertures in the ceiling should be covered with coarse wire-gauze, having a flap of oil-silk attached to it, so as to open upwards with the current from the room, but to close against a downward current. At one end of the milk-room there is a sink, into which milk dirtied by any accident and the drippings of the milk-dishes are poured. No food, either vegetable or animal, should be allowed to enter the milk-house, not even the cream-jars should be admitted. A good mode of purifying the atmosphere of a milk-house is to dip cloths in a solution of chloride of lime, and then hang them up on cords stretching from one corner to the other. In a similar way, too, the temperature of the room may be kept low during hot weather. The other rooms of the dairy are on a higher level than the milk-room, from which one ascends to them by a flight of steps. They are all (except the cheese-loft) finished pretty much in the same way as the milk-room. In the cheese-making room there is a bench of polished stone for setting the utensils, built into the wall and supported on polished stone brackets. The churning-room resembles the cheese-making room in every respect, except that provision has to be made for the shafting which drives the churn, either by making an opening in the wall or by forming an under-ground tunnel. The floor of the scullery should be formed, like that of the milk-house, of flags sloping to a channel; and the skirting of the wall should project, as affording a better protection to the plaster, in a place where large articles have to be moved about. In a small apartment next the scullery a steam-boiler is placed, from which a pipe proceeds, and dividing into two branches, communicates both with the large washing-vessels in the scullery and with one of two cisterns placed in the loft over the milk-room. By means of the former branch the water in the washing vessels may speedily be raised to any temperature up to boiling-point; and by means of the latter a supply of hot water may be obtained for the troughs and jets in the milk-room, and for raising the temperature of the milk in the other rooms, while cold water may be obtained from the cistern adjoining that with which the steam-pipe communicates. The cheese-loft should be nicely plastered, and should have a closely-jointed deal floor and wooden skirting, unless the milk-room is arched, when the floor may be of flagstone, which is much better. All breaks and projections on which dirt or dust could lie are to be avoided. The cheeses are best kept on the turning-racks invented by Mr. Blurton. This consists simply of a series of shelves, open only on one side of the frame-work which supports them, swinging on two pivots half-way up the sides of the whole frame-work. When loaded with cheeses this frame-work has only to be turned one half revolution on the pivots in order that the cheeses may be reversed, care being taken in doing this that the shut side shall be downwards. The top of the frame-work thus exchanges places with the bottom, and the ceiling of every cell in which the cheese has lain on one of its sides becomes the floor on which its other side now rests. The roof of the dairy projects far over

the walls, and is supported by brackets or by posts, so as to form a shed in which the utensils can be exposed to the air.

DAIS, a platform or raised floor at the upper end of an ancient dining-hall, where the high table stood; also a seat with a high wainscot back, and sometimes with a canopy for those who sat at the high table. The word is also sometimes applied to the high table itself. In Scotland it is the name of a long board, seat, or settle erected against a wall, and sometimes so constructed as to serve both for a settee and a table; and also of a seat on the outside of a country-house or cottage, not unfrequently formed of turf.

DAISY, the name of a plant which is very familiar, and a great favourite in Europe (*Bellis perennis*, Linn.) It is one of the earliest in spring, and its elegant flowers, appearing at intervals in the green sward, have been compared to pearls. During cloudy weather and at night they close, and open to the light of the morning sun; hence the name of the flower, day's-eye. The daisy continues flowering during the whole season, and is not used for food by any animal. It belongs to the natural order Compositæ. In the United States of America it is only seen cultivated in gardens. One species of daisy (*B. integrifolia*, Mx.) inhabits the United States, but is a rare plant, and only found in the south-western states, in Tennessee, and Arkansas.

DAKOTA, a territory, United States, formed in 1858 from Minnesota, at the time when the latter was advanced from the position of a territory to the dignity of a state, and having, in addition, also conferred on it a portion of Nebraska, on the right bank of the Missouri. It is bounded on the north by British America, in lat. 49°; on the east by the states of Minnesota and Iowa; on the south by Nebraska, in lat. 42° 30′; and on the west by Nebraska, in lon. 103° w. More than half of the boundary lines are formed by large rivers—the Missouri separating it from Nebraska, and its affluent the Big Sioux from Iowa, while the Bois des Sioux and the Red River of the north separate it from part of Minnesota. It is composed of open grassy plains and rolling prairies, as they are called, or table-lands, with numerous lakes and ponds, and also large streams. Lakes are very numerous and for the most part fresh, but one in the north, called Minni Wakan or Devil Lake, about 40 miles long by 12 broad, and with no known outlet, is salt. The climate in the south is mild, and in the north severe, yet not so much so as we should expect from the degree of latitude. Much valuable timber exists, and the low grounds are extremely productive. Coal and other minerals abound in many parts, and many Indians live by hunting and trapping for furs. Pop. (1870), 14,181.

DAL, a Swedish word signifying, like the German Thal, *valley*, as in *Dalecarlia*.

DALAI LAMA. See Lama.

DALBERG, family of the barons of; formerly Dalburg. 'Is there no Dalberg present!' the imperial herald was formerly obliged to demand at every coronation of the German emperors; and the Dalberg present bent his knee before the new sovereign, and received the accolade as the first knight of the empire. So illustrious were the ancestors of the present Dalbergs, the ancient chamberlains of Worms! The family obtained the rank of barons of the empire in the seventeenth century. Many Dalbergs have distinguished themselves as patrons of German literature.

DALBERG, Karl Theodor Anton Maria von, of the noble family of Dalberg, barons of the German Empire, was chamberlain of Worms, elector of Mentz, arch-chancellor, and subsequently prince-primate of the confederation of the Rhine and Grand-duke of Frankfort; finally Archbishop of Ratisbon, and Bishop of Worms and Constance; born February 8, 1744, at Hernsheim, near Worms. In 1772 he became privy-councillor and governor at Erfurt. During many years' residence in that place he was distinguished for industry, regularity, and punctuality in the discharge of his duties, and animated by an incorruptible love of justice and inflexible firmness in maintaining what he considered just and politic. He encouraged science and the arts by his patronage of learned men and artists, and wrote several learned treatises and ingenious works. In 1802, after the death of the Elector of Mentz, he was made Elector and Archchancellor of the German Empire. By the new political changes in Germany in 1803 he came into possession of Ratisbon, Aschaffenburg, and Wetzlar. In 1806 he was made Prince-primate of the confederation of the Rhine. At Ratisbon he erected the first monument to the famous Kepler. In 1810 he resigned the principality of Ratisbon to Bavaria, and obtained as compensation a considerable part of the principalities of Fulda and Hanau, and was made grand-duke. In 1813 he voluntarily resigned all his possessions as a sovereign prince, and returned to private life, retaining only his ecclesiastical dignity of archbishop. He retired to Ratisbon. He was a member of the French National Institute. His works are mostly philosophical. Among them are the Betrachtung über das Universum, the Grundsätze der Aesthetik, and Pericles über den Einfluss der schönen Künste auf das öffentliche Glück. He wrote several of his works in French. He is also the author of several legal treatises. Although he was fond of theoretical speculations, yet he devoted his attention more particularly to practical studies, such as the philosophy of the arts, mathematics, physics, chemistry, botany, mineralogy, scientific agriculture, &c. Dalberg died February 10, 1817.

DALBY, Isaac, a self-educated mathematician, born in Gloucestershire in 1744, was intended to be a cloth-worker; but having a decided turn for mathematics, qualified himself by private study to become an usher, and afterwards took up a school on his own account. Not meeting with much success, he went to London in 1772, and was employed to teach arithmetic in Archbishop Tenison's grammar-school at Charing Cross. Chiefly by the solutions which he gave to mathematical questions proposed in the Ladies' Diary, his acquirements became known; and he was introduced to the acquaintance of Dr. Maskelyne, astronomer-royal, and other men of science. In 1782 he was appointed mathematical master of the naval school at Chelsea, and in 1787 was employed, on the recommendation of the celebrated instrument-maker Ramsden, to assist General Roy in the great trigonometrical survey. In 1790 a paper by him on the figure of the earth appeared in the Philosophical Transactions. In 1799, on the formation of the Royal Military College at High Wycombe, he was appointed professor of mathematics, and continued to hold the appointment after its removal to Farnham till 1820, when the infirmities of age obliged him to resign. He reached the advanced age of eighty-one, and died in 1824. His course of mathematics, in two vols., for the use of the Military College, has often been reprinted.

DALE, David, an eminent manufacturer, was the son of a grocer in Stewarton, Ayrshire, and born there on 6th January, 1739. He commenced life as a weaver, then became clerk to a silk-mercer in Glasgow, and afterwards adopted the trade of a yarn-merchant, by which he acquired a considerable fortune. Having made the acquaintance of Sir Richard Arkwright on the latter's visit to Scotland in 1783, a partnership was entered into between

them for the erection of cotton-mills on the Clyde, and the settlement of New Lanark was in consequence formed. Circumstances, however, brought soon to a close his connection with Arkwright, and the New Lanark mills became exclusively his own property. He had also extensive shares in other spinning factories established under his superintendence in various parts of Scotland, and was head-partner in a large manufacturing firm in Glasgow, besides acting there as agent for the Royal Bank of Scotland. In 1799 he retired from business, and disposed of the works at New Lanark to a company of English capitalists, who intrusted the management of them to the celebrated Robert Owen, who not long afterwards married Mr. Dale's eldest daughter. A few years after giving up business Mr. Dale died at his house, Charlotte Street, Glasgow, on 17th March, 1806.

DALECARLIA, or DALARNE, a former province, Sweden, now included in the län or county of Falu. The name, meaning Valley-Land, is still frequently used, and is kept alive in the minds of the inhabitants by the noble struggles which the Dalecarlians, its inhabitants, made to establish and maintain the independence of the country.

DALGARNO, GEORGE, born at Aberdeen about 1627, took up his residence at Oxford, where, according to Anthony-a-Wood, he taught a private grammar-school for about thirty years, and where he died, August 28, 1687. Though his merits have been strangely overlooked, both by his contemporaries and successors, he was undoubtedly a man of great original genius and extensive acquirements, and has left behind him two works which ought to have been sufficient to establish his fame. The one, entitled Ars Signorum, vulgo Character Universalis et Lingua Philiosophca (London, 1661), contains ingenious speculations concerning a universal language, and undoubtedly contains the germ of the celebrated work, Essay towards a Real Character, published by Bishop Wilkins seven years after the work of Dalgarno, but without the least reference to it, though it must have been well known to him. The other work of Dalgarno is entitled Didascalocophus, or the Deaf and Dumb Man's Tutor. Though pedantic in its style it is very philosophical in its spirit, and with remarkable sagacity adopts, *a priori*, the general conclusions concerning the education of the dumb, which, more than a century after, were happily confirmed by experience. The Didascalocophus has been reprinted for the Maitland Club.

DALHOUSIE, JAMES ANDREW BROWN RAMSAY, TENTH EARL AND FIRST MARQUIS OF, born in 1812, was educated at Harrow and at Christchurch, Oxford. In Scotland, when the Established Church was threatened with what is now known as the Disruption, he availed himself of his seat as an elder in the General Assembly to deliver a very decided speech against the popular movement, and on finding himself in a minority declared his determination to take no further part in the deliberations. The speech, corrected by himself, was afterwards published. In 1843 he became vice-president, and in 1844 president of the board of trade. This was during the ministry of Sir Robert Peel, but his management was so judicious and so much approved by all parties, that Lord John Russel, on becoming premier in 1846, asked and obtained his consent to remain in office. A more important appointment awaited him. By the resignation of Lord Hardinge the office of governor-general of India had become vacant, and was conferred on Lord Dalhousie, who accordingly sailed for India in November, 1847. Shortly after his arrival a new Sikh war broke out, and when victory declared in favour of the British troops, his lordship, rewarded for his success with a marquisate, apparently had no alternative but to incorporate the Punjab with our Indian Empire. The same thing may be said of Pegu. The Burmese had forced him into a war which he was most anxious to avoid, and there was no means by which he could so effectually prevent its recurrence as by the seizure of that province. Unfortunately he was not satisfied with these acquisitions, and in regard to native states with which he had no ground of quarrel stretched the claims of the British government as the paramount power in India to such an extent as to cause general alarm. Hitherto Hindu princes dying without issue or direct heirs had been succeeded by persons either previously adopted by themselves, or adopted by their family after their decease, in concert with their *durbar*, or council. Lord Dalhousie did not venture to interfere when the adoption was regularly completed previous to the vacancy, but in all other cases he insisted that the consent of the paramount power might be given or refused at pleasure. In fact, refusal was his lordship's rule, and on no other ground than an alleged failure of heirs, he, in the course of a few years, extinguished the national independence and made British provinces of the native states of Nagpore or Berar, Sattara, and Jhansi. The last act that he had to perform as governor-general of India was perhaps the most trying task of his administration. The annexation of Oude had been determined on, and though suffering much in health he chivalrously consented to remain in India beyond the usual period of service, in order to give government the aid of his name and experience in the annexation. It is doubtful if an earlier return would have saved him, but when he returned to Europe in 1856 it was with a constitution so completely shattered, that he was never able to appear again in public life, and died on 19th December, 1860. As he left no direct male issue, his marquisate expired with him.

DALIN, OLOF or OLAUS, the father of the Swedish literature of the eighteenth century, was born in the district of Winberga, 1708, and studied successively medicine, law, philosophy, and belles-lettres. In 1737 he was appointed royal librarian, and some years afterwards he set out upon his travels, visiting every important state of Europe. In 1751 he became preceptor to the prince royal (afterwards Gustavus III.), and in recompense for his zeal and talents was nominated historiographer-royal (1759) and chancellor of the court of Sweden (1763). His death took place in the August of that year. He exerted much influence by his periodical paper, The Swedish Argus (1733–34), and still more by his spirited poems, particularly Satires (1729), an excellent poem on the liberty of Sweden (1742), many songs, epigrams, and fables. The best edition of his poetical works appeared at Stockholm, 1782–83, in two vols. He acquired equal reputation by his able history of Sweden (Stockholm, 1777, three vols. 4to, translated into German by Benzelstierna and Daelmert, Greifswalde, four vols. 4to). He also participated in the foundation of the Academy of Belles-lettres by Ulrica Eleonora, 1753.

DALKEITH, a town of Scotland, in the county of and 6 miles S.S.E. from Edinburgh, is finely seated on a tongue of land formed by the North and South Esk, the banks of which are fringed with wood, and further adorned with elegant villas. Among these, upon the site of a castle, for ages the chief seat of the noble family of Morton, stands the mansion of the Duke of Buccleugh. The town comprises a spacious, well-built street, with several inferior streets branching from it. The public buildings are an old and new parish church, a beautiful Episcopal chapel, erected by the Duchess of Buccleugh in 1845, and

various other churches; a grammar-school, a court-house, and a beautiful bridge over the Esk. The industrial establishments are a woollen factory, candle works, breweries, tanneries, foundries, and flour-mills. Coal is extensively worked in the vicinity. The corn market, held every Thursday in the commodious market-hall, is one of the most important in Scotland. Pop. 6386.

DALLAS, Robert Charles, one of the friends and biographers of Lord Byron, was born in Jamaica in 1754, and studied law in the Inner Temple. When he came of age he married, and went to Jamaica, where he had received a lucrative appointment, but was obliged to leave the island on account of the ill health of his wife. He went to France, then to America, with a view to settle there, but, being disappointed, returned and devoted himself to literature. His productions, including translations, are numerous. His novels have been collected and published in seven vols. 12mo. Lord Byron made him a present of the copyright of the first and second cantos of Childe Harold and some other of his early works, which afforded him much pecuniary advantage. Dallas had almost completed his Recollections of Lord Byron from the year 1808 to the end of 1814 when he died at St. Adresse, Normandy, 21st Oct. 1824.

DALMATIA, Kingdom of [German, *Königreich Dalmatien*], a province of Austria, and the most southern portion of the Austrian dominions. It consists of a long narrow triangular tract of mountainous country, and a number of large islands, along the north-east coast of the Adriatic Sea, and bounded N. by Croatia, and N.E. by Turkey. It extends from about lat. 42° 9′ N., or 23 miles S.E. Cattaro, to lat. 44° 25′ N., about 19 miles N. Zara, the capital, where it is joined by Croatia. In breadth it is very limited, not exceeding 40 miles in any part; and at the narrowest, near Ragusa, about 2 miles; its whole area is 4940 English square miles. The surface is much varied: a ridge of limestone mountains separates the north portion from Turkey, and another runs nearly parallel with the coast, sterile, and destitute of soil. The highest peaks are—Orien, 6332 feet; Dinara, 6040 feet; and Partovo, 5929 feet; and the largest and loftiest part of the north range is that of Velebich, to the north-east of Zara, which is 5439 feet. On the coast range occur the peaks of Mount Mossor, 4464 feet; and south-east, Mount Biocovo, 5899 feet. The inland parts of Dalmatia are diversified by undulatory ground, hills, and high mountains—many of the latter having the same rugged barren aspect as those of the coast; others, again, are partially covered with low wood. There are also several extensive and unwholesome marshes in various parts of the country, causing deadly fevers in hot weather. The soil, though not rich, is good, and the produce, as a whole, suffices for the limited population of the country; but, altogether, it cannot be otherwise considered than as a poor, unproductive territory, though not without some rich and beautiful valleys; but these are generally very narrow. It has few rivers, and all with short courses. The principal are—the Narenta, in the south, having a depth of water sufficient to admit large steamers; the Zermagna, Kerka, and Cettina. On some of these rivers the scenery is singularly wild and picturesque. The Kerka has several magnificent cascades; and on the Cettina there are two from 90 feet to upwards of 100 feet high. There are also numerous small lakes; but most of them become dry in hot weather. The waters of many of the Dalmatian streams have a petrifying quality, and cover the rocks over which they flow with a coarse stalagmitic deposit. The country is not rich in metals, although in ancient times it produced large quantities of gold; but iron and coal are wrought.

The coast is indented with numerous harbours and bays, the principal of which are Cattaro, Sebenico, and Ragusa. A vast number of islands, also, of all dimensions stretch along and parallel to its shores. The largest are Arbe, Pago, Isola Grossa, Brazza, Lesina, Curzola, Lissa, Meleda, &c. Most of these islands are mountainous, and present the same general aspect as continental Dalmatia; but are valuable for their productions, such as timber, wine, oil, cheese, honey, salt, and asphalt; and in several of them ship-building is carried on to a considerable extent. In summer the prevalent wind on the coast is the mistral, or north-west wind, which moderates the excessive heat of the season. The climate of Dalmatia, generally, is warmer than in any other part of the Austrian dominions; and in spring the African sirocco is occasionally felt, but not to the same extent as in Sicily or Greece. Frost and snow rarely occur in the lower districts, and are of but short duration in the mountains. Timber is exceedingly scarce in the country, nor is firewood abundant; but some of the islands produce pines and brushwood in great quantities—particularly Curzola, which, in former times, furnished the Venetian arsenal with timber, and has still the greatest quantity of wood in this part of the Adriatic.

Agriculture is in an extremely backward state; but it is said that the peasantry require only proper instructions in directing their labour to remedy this evil. At present the greatest proportion of available land is in pasture, the next in wood, and then arable land and vineyards. The principal agricultural productions are Indian-corn, rye, barley, figs, olives, and vines; but sufficient grain is not produced to supply the wants of the country—the deficiency being imported from Turkey and Hungary. Various fruits are also grown, including apples, pears, plums, almonds, peaches, apricots, lemons, oranges, carobs, and pomegranates. The Dalmatian wines are strong and full-bodied; but most of them have the fault of being sweet, owing to the grapes remaining too long upon the vines before they are gathered. Comparatively few sheep or cattle are reared; horses are rare and of very diminutive size. Fish abound on the coast; the staple kinds of which are the sardine and tunny; salmon-trout, often of extraordinary size, are plentiful in some of the rivers. Dalmatia has hardly any manufactures worthy of the name. A kind of coarse cloth used by the peasants is made, but both the quality and dye is of the worst description. Nor is the production of silk sufficiently encouraged, though the soil is well suited to the growth of the mulberry-tree. There is a considerable manufacture of liqueurs at Zara, the principal of which is the far-famed Maraschino. The trades common in all parts of the world are found in the towns; and thread, a few cotton and linen stuffs, twine and ropes, leather, felt, coarse blankets, and some of the most ordinary productions of the hand, compose the principal articles made in Dalmatia—the shops being supplied with cutlery and all manufactured goods from abroad, and principally from Trieste. A few silk handkerchiefs are made at Ragusa.

The Dalmatians of the coast, and the principal families in the large towns of the interior, are mostly of Venetian extraction; and those who are of Hungarian origin have adopted the customs and language of the Italians. The latter is spoken in all the seaports; but the language of the country is a dialect of the Slavonic, which alone is used by the peasants in the interior. The Dalmatians are a tall, muscular, and vigorous race, and extremely hospitable, but lazy, vindictive, and dissipated. The dress of the

peasant is very picturesque, resembling the Turkish costume. On his head he wears a Fez cap, and in his belt a brace of huge pistols. In some parts the dress of the women is very graceful, consisting of a short cloth pelisse—generally red, green, or blue—fastened at the waist by a gold clasp; and their hair is bound round the head in two large plaits, interwoven with a red ribbon. The garb of the male inhabitants of the coast consists in blue tight pantaloons, a blue waistcoat, and in winter a spencer, with a coarse brown cloak.

The majority of the inhabitants are Roman Catholics, but there are also a considerable number of Greek Catholics. Education is generally diffused by the system of national schools, but it is of a very elementary character. Principal towns—Zara the capital, Spalatro, and Ragusa. Dalmatia was conquered by the Romans in the time of Augustus. In the seventh century it was taken by the Slaves, who founded there a kingdom that lasted till 1050, when the greater part of it was united to Hungary, and the remainder passed under the protection of Venice. In 1797 the Venetian portion, along with the city of Venice, was ceded to Austria; but in 1805, by the treaty of Pressburg, it fell into the hands of Napoleon, who first united it to the Kingdom of Italy, and subsequently, in 1810, to the Kingdom of Illyria. The events of 1814 brought Dalmatia again under Austrian rule. A partial insurrection broke out against the government in October, 1869, but was suppressed in the December of that year. Dalmatia has a diet of its own of forty-three members; three of this body are elected by it to sit in the Austrian House of Representatives. Pop. 456,961.

DALMATIC, a long gown, generally made of coloured silk, worn since the time of Pope Sylvester I. (314–336), by the Roman Catholic deacons, over the alb and stole. It was an imitation of a garment worn by the Dalmatians.—Also a part of the ornamental dress formerly worn by the German emperor at the time of his coronation. It was kept in Nuremberg, and put on in Frankfort.

DALRIADA, the ancient name of a territory in Antrim, called after Carbry Riada, one of its chiefs. Under this leader a band of Irish settled in Argyleshire about the middle of the third century. The descendants of these colonists, about the sixth century, founded in that district of Scotland what was long known as the Dalriadic Kingdom, or Kingdom of the Dalreudini, and which eventually, on the seizure of the Pictish throne by Kenneth Macalpine, in the year 843, became the kingdom of all Scotland.

DALRY, a town of Scotland, county of Ayr, beautifully situated on the Garnock, 19 miles S.W. of Glasgow. It occupies a height, and consists of five principal streets, substantially but irregularly built. The chief employment used to be silk and cotton hand-loom weaving, but the recent establishment of extensive ironworks and the opening of coal-pits in its vicinity and the adjoining districts have changed its character, and given a great impulse to its prosperity. Pop. in 1871, 5214.

DALRYMPLE, Alexander, an eminent modern hydrographer, was the son of Sir James Dalrymple, of Hailes, near Edinburgh, where he was born in 1737. In 1752 he went out to India as a writer in the service of the East India Company. While there he made hydrography his particular study; and in 1759 he was engaged in a voyage of observation, in the course of which he displayed his talents to advantage. In 1763 he returned to England; and when it was determined to send an expedition to the South Sea, to observe the transit of Venus, Mr. Dalrymple would have been employed to conduct it, but he insisted on having the command of the vessel engaged for the occasion; which, as he had never served in the navy, could not be allowed, and his place was supplied by Cook. In 1775 Mr. Dalrymple went to Madras, whence he returned in 1780. In 1795 he obtained the appointment of hydrographer to the Admiralty, as well as to the East India Company. The former situation he lost a short time before his death, which happened in 1808. His most important publications are, Discoveries in the South Pacific Ocean (8vo); A Collection of South Sea Voyages (two volumes, 4to); A Relation of Expeditions from Fort Marlborough to the Islands of the West Coast of Sumatra (4to); A Collection of Voyages in the South Atlantic Ocean (4to); A Memoir of a Map of the Land Round the North Pole (4to); Journal of the Expeditions to the North of California (4to); The Oriental Repertory (two volumes, 4to). He was also the author of many historical and political tracts on the affairs of the East India Company.

DALRYMPLE, Sir David, better known by the name of Lord Hailes, a Scottish lawyer, antiquary, and historian. He was elder brother of the preceding, and was born at Edinburgh and educated at Eton, after which he studied the civil law at the University of Utrecht. In 1748 he was called to the bar, and practised in the Scottish courts. In 1766 he was made a judge of the Court of Session, when he assumed the title of Lord Hailes, by which he is best known. On the resignation of his father-in-law, Lord Coalston, in 1776, he was made a commissioner of the justiciary. He died Nov. 29, 1792, aged sixty-six. The private character of Lord Hailes was extremely estimable; and he was much respected by Dr. Samuel Johnson and other literary friends, with whom he carried on an extensive correspondence. His publications were very numerous, but they principally consist of new editions and translations of old works, and editions of manuscript papers. Of his original productions, The Annals of Scotland, from the accession of Malcolm Canmore to that of the house of Stuart, and the inquiry into Gibbon's Secondary Causes, are the most important.

DALRYMPLE, James, the first Viscount Stair, an eminent Scottish lawyer and statesman, was born in Ayrshire, 1619. In the civil war he sided with the Parliament, but soon relinquished that party, and became professor of philosophy at Glasgow. On the Restoration he received the honour of knighthood, and in 1671 was made president of the Court of Session; but he was dismissed from all his employments in 1682 on refusing to take the celebrated test oath. He then retired to Holland and became a favourite with the Prince of Orange, who, after the Revolution, raised him to the peerage. He died in 1695. He wrote—The Institutes of the Laws of Scotland (folio, which is still a standard authority); Philosophia nova experimentalis; Vindication of the Divine Perfections; and An Apology for his Own Conduct.

DALRYMPLE, John, second Earl of Stair, born at Edinburgh in 1673. Having had the misfortune, while yet a mere boy, to kill his elder brother by the accidental discharge of a pistol, he was for a considerable portion of his youth excluded from the family circle. He was educated first under the care of an Ayrshire clergyman, and then at Leyden. While studying there he entered the Cameronian Regiment in 1692, and was present at the battle of Steinkirk. At the request of his family he commenced the study of law, but soon abandoned it, and in 1701 was appointed lieutenant-colonel of the Scots regiment of foot guards. In 1702 he acted as aide-de-camp to the Duke of Marlborough, and was present at the taking of Venloo and Liége. In 1707 he succeeded to the earldom and became one of the Scottish repre-

sentative peers, but he still continued his military life, and distinguished himself in the campaigns of Marlborough, and more particularly at the battles of Oudenarde, Malplaquet, and Ramillies. When faction during the reign of Queen Anne stopped the career of his celebrated chief in 1711 he abandoned the army and retired to private life. On the accession of George I. he was appointed a privy-councillor, and went on a diplomatic mission to France, where he attracted much notice by the splendour of his retinue, and also displayed great skill and address. He returned in 1720, and for the next twenty years lived at his seat at Newliston, where he took an active interest in agricultural pursuits. In 1742, on the dissolution of Walpole's administration, he again entered public life, and continued to act in different capacities, civil and military, till his death at Edinburgh in 1747. He was married, but left no children.

DAL SENGO (Italian), often contracted into *D.S.*, means *from the sign*. In music this expression denotes that the singer or player ought to recommence at the place where the sign 𝄋 is put.

DALTON, a market town, England, in the county and 16 miles W.N.W. of Lancaster, on the Furness Railway and a canal of 3½ miles communicating with the sea. In its vicinity are extensive ironworks, and the ruins of the magnificent Cistercian abbey of Furness, founded in 1127 by Stephen, afterwards King of England. The celebrated painter Romney was born here. Pop. 9130.

DALTON, JOHN, an eminent chemist and natural philosopher, born at Eaglesfield, near Cockermouth, in Cumberland, Sept. 5, 1766, was educated by John Fletcher, a Quaker, and at the age of fifteen became usher in a school kept by his cousin John Bewley. In early life he showed a decided turn for mathematics, and acquired such proficiency in them that he obtained the situation of professor of mathematics and natural philosophy in the New College, Mosley Street, Manchester, in 1793. The same year he published his meteorological observations and essays. In 1794 he became a member of the Literary and Philosophical Society of Manchester, and long continued to enrich its Transactions with valuable papers. In 1799, on the removal of the New College to York, he resigned his chair, but continued to give private lessons in the same branches. In 1808 he commenced the publication of his new system of chemical philosophy, which, containing his brilliant discovery of the atomic theory, produced an important revolution in the science, gave him a very high if not the very first place among philosophical chemists, and spread his fame over Europe. Literary honours now reached him from all quarters. He was created D.C.L. by the University of Oxford, and LL.D. by that of Edinburgh. The Royal Society of London in 1826 admitted him a member, and unanimously awarded to him the first of two gold medals intended for those who had made the greatest discoveries in science. He was also elected member of the Institute of France, of the Royal Academies of Science of Berlin and Munich, and of the Natural History Society of Moscow. In 1833 the crown bestowed upon him a pension of £150, which was afterwards increased to £300. The honours and emoluments thus bestowed made no change on his unassuming manners and simple habits of his life, and he continued to the last to be a regular attendant at the meeting of Friends, to which body he had always belonged. He died July 27, 1844.

DALTONISM, another name for COLOUR-BLINDNESS, which see.

DALTON'S LAW. See EVAPORATION.

DALYELL, THOMAS, of Binns, in West Lothian, born about 1599, a Scottish officer on the Royalist side, who was taken prisoner at the battle of Worcester, and confined in the Tower, from which he escaped to Russia, where the czar made him a general. At the Restoration he returned to England, and Charles II. made him commander-in-chief of his forces in Scotland, where his memory is still execrated for his cruel persecution of the Covenanters. He was singular in his dress and appearance. After the death of Charles I. he never shaved his beard, which grew white and bushy, and descended to his middle. He generally went to London once or twice a year to kiss the king's hand, and the singularity of his appearance drew crowds of boys after him. He is mentioned by Scott in his description of the defeat of the Covenanters in Old Mortality. He died in 1685.

DAM, a bank or construction of stone, earth, or wood across a stream for the purpose of keeping back the current to give it increased head, for holding back supplies of water, for flooding lands, or for rendering the stream above the dam navigable by increased depth. Probably the highest dam in the world is that constructed in 1594 in the province of Alicante in Spain. Its height is 156½ feet, thickness at top, 69½ feet, and its length, 272½ feet. It is built between two mountains, which closely approach each other, and is used for collecting water in winter to be employed in irrigating the vineyards in the neighbourhood. For details on the construction of dams see EMBANKMENT and RESERVOIR.

DAM, DAMM, the end of many German and Dutch geographical words, signifying a *dam* or *sluice;* as in *Amsterdam*, the sluices of the Amstel.

DAMAGE-FEASANT. Beasts are said to be damage-feasant, or *doing damage*, when those of one person are found upon the land of another without his permission and without his fault; for if the owner of a field or inclosure adjoining upon another inclosure neglects to repair his fences, and the beasts pass through, he cannot seize them as damage-feasant. But if the beasts break into a close from the highway, where they were wrongfully left to run at large, the owner of the close may take them up, or distrain them as damage-feasant, though the fence of the close on the side next the highway was defective, for the owner is not obliged to make a fence against beasts where they cannot be lawfully left at large. The owner of land has a right to sue the owner of the beasts in trespass for the damage done by them to his crops, &c., but the law gives him also the means of stopping the damage, for he may distrain and impound the beasts, but he cannot sell them for damage done; moreover, the impounder is bound to supply the beasts with food and water under a penalty of 40*s*. All parties seeking to unlawfully release cattle seized for such distress lay themselves open to a penalty of £5.

DAMAGES, in law, pecuniary compensation paid to a person for loss or injury sustained by him through the fault of another. It is not necessary that the act by which the person who claims damages has been injured in property, person, or feelings should have been a fraudulent one; it is enough that the act be illegal, unwarrantable, or malicious. If, however, a person has suffered a loss through fraud or delict on the part of another, that person has not only a claim to ordinary damages, but may also claim remote or consequential damages, and may estimate the amount of the loss he has sustained not at its real value, but at the imaginary value which he himself may put upon it, subject, however, to the modification of a judge or a jury. In other cases the damages cover only the loss sustained estimated at its real value, together with the expenses incurred in obtaining damages. In actions for defamation of character the

damages are always laid by the claimant at an arbitrary amount, and are subject to modification by a judge or a jury. In cases of breach of contract damages are only due when it is impossible to enforce the specific performance of the contract. By English law no damages can be recovered in real actions, that is, actions for the recovery of lands, tenements, and hereditaments; but they may be recovered in all personal actions, and in several kinds of processes they are the sole object of the action. Formerly chancery was not able to give damages in compensation for a fraud or for the non-performance of a contract relating to the sale and purchase of realty; but this defect in English law was remedied by act 21 and 22 Vict. cap. xxvii. (Chancery Amendment Act, 1858). Damages are usually decreed in equity only as incidental to some other relief, or where some special equity intervenes (Bell's Dictionary of the Law of Scotland; Wharton's Law Lexicon).

DAMAN. See HYRAX.

DAMAN, a seaport town, Hindustan, province of Gujerat, at the mouth of the Gulf of Cambay, on the Damungunga or river of Daman, 100 miles north from Bombay; lat. 20° 25′ N.; lon. 72° 58′ E. It belongs to the Portuguese, who conquered it in 1531, and have kept possession of it ever since. The town has a prepossessing appearance from the sea, the houses being generally whitened, but the streets are narrow and dirty. It has several churches and convents. The commerce of the place is rapidly declining, but ship-building is still carried on, timber being obtained from the adjoining teak forests. Pop. about 6000.

DAMAR, or DEMAR, a town, Arabia, Yemen, 120 miles north by west Aden, agreeably situated on an eminence. It has a castle, where the governor resides, and a college for the sect of Zeites, attended by several hundred students. It was once the seat of the Himyarites, and has about 5000 well-built houses.

DAMAR (DAMMAR or DAMMARA) PINE, a genus of trees of the natural order of Coniferæ, from all other species of which they are well known, firstly by their large lanceolated leathery leaves, the veins in which are numerous and nearly parallel, diverged a little at the base, and converging at the apex; and secondly, by their seeds having a wing on one side instead of proceeding from the end. The *Damara orientalis* is a lofty tree, attaining on the mountains of Amboyna and on some of the Molucca Islands a height of from 80 to 100 feet. Its timber is of little value, being wholly unfit for any situation exposed to wet, but it yields the well-known Damara resin, for which see following article. The Kauri pine, or *Damara australis*, is a magnificent tree rising to a height of 150 to 160 feet; is found in Australia; yields a darker gum than the former tree, and is in great demand from the straightness of its trunk and the toughness of the timber for ships' masts.

DAMARA (or DAMMARA) RESIN, or DAMMAR. There are two varieties of this substance. The East Indian, called *cat's eye resin*, is got from pines growing in the Moluccas. It forms large transparent, colourless, glassy masses, which do not powder easily. It has no smell, a resinous taste, specific gravity from 1·04 to 1·12, softens at 212°, and becomes liquid at a higher temperature, dissolves in ether, alcohol, and oils, and furnishes a number of acids when extracted with aqueous alcohol and other solvents. The other variety is from New Zealand, and is known as *cowdie* or *kauri gum* or *resin*. It exudes from a coniferous tree: it is colourless, or pale-yellow, hard, brittle, has a faint odour and resinous taste. It dissolves in strong alcohol, and fuses readily on heating. It is also said to consist of acids, but they are not apparently identical with those from the other variety. Both resins are used for varnishes, for which purpose colourless pieces are selected and dissolved in turpentine. Other resins are also described under the name of *dammara*. The *aromatic dammara* is sold in large flat cakes, earthy on the outside, but yellow and resinous when broken, and with a marked odour when rubbed. *Dammara saul* is obtained from *Shorea robusta*, which grows in Northern India. It is dark-chestnut, opaque, and is met with in small flat pieces, with the impression of the bark upon them. *Black dammara*, *red dammara*, or *dammar daging*, and *dammara matu hoocking*, are obtained from trees growing in Assam, Burmah, and the Malay Peninsula.

DAMASCENUS, JOHN, John of Damascus, afterwards called also *John Chrysorrhoas*, was born at Damascus about 676. He was nominated governor of that town by Caliph Ali, but resigned that dignified office, and became a hermit in a monastery near Jerusalem. His death took place about 760. He was the author of the first system of Christian theology in the Eastern Church, or the founder of scientific dogmatics. He first endeavoured to give a full system of dogmatics, founded on reason and the Bible, which had hitherto been elaborated in the Greek Church only in parts, as ecclesiastical controversies arose. His explanation of the orthodox faith, in four volumes, enjoyed in the Greek Church a great reputation. He also wrote Dialectics, a system of logic on the principles of Aristotle, and prepared a collection of philosophical passages, extracted from ancient works, in alphabetical order, &c. The best edition of his Greek works is that by Lequien (Paris, 1712, two volumes, folio).

DAMASCIUS, so called from his supposed native place Damascus, flourished in the beginning of the sixth century, and is known as one of the most distinguished teachers of the Neo-platonic philosophy. He went in early life to Alexandria, where he studied rhetoric under Theon and mathematics under Ammonius, and afterwards repaired to Athens, where his teachers were Zenodotus and Marinus, the successors of the more celebrated Proclus. He also formed a close friendship with Isodorus, and ultimately succeeded him in his chair at Athens. Shortly after the heathen schools of philosophy in that celebrated metropolis were closed by the Emperor Justinian, and Damascius, with most of the other teachers, repaired to the court of the Persian monarch Chosroes, but he afterwards returned to the West, protected it is said by a stipulation which Chosroes had introduced into a treaty with the Byzantine emperor, to the effect that toleration should be given to the religion and philosophy of the heathen votaries of Platonism. The events of his subsequent life are unknown. Numerous fragments of his writings remain, but the only one which has yet been printed is entitled Doubts and Solutions respecting the First Principles. It is so mystical as to be often altogether unintelligible, but is important to the history of philosophy from its frequent notices of earlier philosophers.

DAMASCUS (Arabic, *Demesk*), a celebrated city, Asiatic Turkey, Syria, capital of the pashalic Damascus, beautifully situate on a plain, at the eastern base of the Anti-Libanus range, about 180 miles S. by W. Aleppo; supposed to be the most ancient city in the world. It is 6 miles in circumference, and is surrounded by a dilapidated wall. Its appearance, when it first opens on the view, has been spoken of by all travellers, in all ages, in the most rapturous terms. It is said of Mahomet, that when he looked upon it he exclaimed, that as man could have but one Paradise below, he would not enter it, lest he should have

none above. The plain on which the city stands is of great extent, and is covered with the most beautiful gardens and orchards, irrigated by the limpid waters of the Barrada, forming a waving grove of more than 50 miles in circuit, rich in the most luxuriant foliage and the finest fruits, including oranges, lemons, citrons, pomegranates, mulberries, figs, plums, walnuts, pears, apples, &c. As, however, is the case in nearly all eastern cities, the interior of Damascus by no means corresponds with the beauty of its environs. The streets are narrow and crooked, and have, many of them, a gloomy and dilapidated appearance; they are paved with basalt, generally in three divisions—that in the middle devoted to cattle and riders being the lowest, and of the same size as the other two. In the Armenian quarter the houses are built with mud, and pierced, towards the street, by a very few small grated windows, with red painted shutters. They are low, with flat-arched doors, resembling those of stables, while a dunghill and pool of putrid water almost invariably stand before each door. In many of them, however, a singular contrast is presented between the dull, prison-like outer walls of gray mud and the richness within. Interiorly they are of a quadrangular form, inclosing a court paved with marble, ornamented with beautiful trees and flowering bushes, and having copious fountains playing in the centre. The lower rooms on each side of the court are raised above its area, and open in front—their roofs and walls highly ornamented with figures of flowers and inscriptions, and a variety of arabesque devices. The furniture, also, is of the most splendid description. The best and wealthiest part of the city is the Moslem quarter, where the streets are wider and cleaner, the houses higher and better built, and the supply of water much more abundant than in any other part of the town. The Christian and Jewish quarters are the most miserable.

Amongst the places most worthy of notice in Damascus are the bazaars. They are merely long streets—the principal one about 1½ mile in length—covered in with high wood-work, and lined with shops, stalls, magazines, and cafés. The shops are narrow, and go only a short way back. There is a separate bazaar for almost every commodity exposed to sale, and all of them are patrolled by multitudes of confectioners and dealers in ices and cooled sherbets. In the midst of the bazaars stands the Great Khan, said to be one of the most magnificent structures of its kind. It is an immense cupola, supported on granite pillars, and built, in part, of alternate layers of black and white marble. Its gate is one of the finest specimens of Moorish architecture to be seen in the world. In this building, and in thirty inferior khans, purchases and sales are daily conducted by the merchants, who have their counting-houses near them. The principal mosque is also a fine edifice, and was originally a Christian cathedral. There are three Latin monasteries in Damascus—those of the Franciscans, Capuchins, and Lazarists. The principal Roman Catholic churches form part of the monastic buildings; there are, besides, a number of detached churches belonging to different sects in various parts of the city. Besides the more remarkable architectural objects mentioned, there are an extensive citadel, and a seraï or palace, in which the pasha resides. The most interesting locality in the city is, perhaps, what is called 'Straight Street,' mentioned in connection with the conversion of the apostle Paul. It is the most important and capacious street in Damascus, and one of its busiest scenes; it is about 1 mile in length, and runs from east to west. The house of Judas, also, to which Ananias went, is still pointed out, as well as that of Ananias himself.

Damascus is the chief emporium of the trade in European manufactures with Bagdad, Bassora, Persia, and the neighbouring countries; it is also a place of considerable manufacturing industry. There are a number of manufacturers of silk, damasks, cotton, and other fabrics; the looms for working which amount to 4000. There are, besides, numerous cotton-printing and dyeing establishments, tobacco factories, copper and iron foundries, glass works, soaperies, &c. The manufacture of Damascus blades, for which the city was once so celebrated, no longer exists. Saddles and bridles, rich and highly-finished, fine cabinet work, and elegant jewellery, are amongst the manufactures of Damascus. It is one of the holy cities, and here the pilgrims assemble on their journey to, and separate on their return from Mecca. Until a very recent period no Christian could walk the streets without incurring the risk of being insulted, and probably maltreated, by its fanatical population; and no farther back than the year 1860 a considerable number of Christians were massacred by the bigoted Moslems. This intense hatred of the Frank, however, is now considerably abated.

Damascus continues to be the most thoroughly oriental city in all its features and characteristics of any city in existence. Of its origin nothing certain is known. There is, however, abundant evidence of its great antiquity, as it is mentioned in Gen. xiv. 15, as existing 1913 years B.C., and appears even then to have been a place of note. At subsequent periods it fell successively under the power of the Israelites under David, the Persians, Greeks, and Romans, attaining great eminence under the last. In 1516 it fell into the hands of the Turks, who retained it till 1832, when it was taken by Ibrahim Pasha, but reverted again to the Turks when the Pasha of Egypt was compelled to evacuate Syria. It is the native place of the geographer and historian Abulfeda. Beyrout, distant about 58 miles N.W., is the seaport of Damascus. Pop. 160,000; of which 15,000 are Christians, 6000 Jews, and 4000 to 5000 Druses.

DAMASK, an ingeniously manufactured stuff, the ground of which is bright and glossy, with vines, flowers, and figures interwoven. At first it was made only of silk, but afterwards of linen and woollen. According to the opinion of some, this kind of weaving was derived from the Babylonians; according to others, invented at a later period by the inhabitants of Damascus, from which latter place it is thought to have derived its name. The true damasks are of a single colour. In modern times the Italians and Dutch first made damask; and Europe was supplied, as late as the seventeenth century, from Italy alone, chiefly from Genoa. But the French soon imitated it, and now surpass the Italians. Damask is made in great quantities in Germany, chiefly in Upper Lusatia. Dunfermline is the chief seat of the manufacture of damask napery in Scotland, and Lisburn and Ardoyne in Ireland.

DAMASKEENING, or DAMASCENING, the art of inlaying iron or steel with other metals, especially gold and silver, is of great antiquity. Herodotus mentions a saucer so ornamented; as also were the shields of some of the forces of the Samnites who fought against Rome. The most beautiful specimens of this work are produced by cutting into the metal with a graver and other tools proper for engraving on steel, and afterwards filling up the incisions with a pretty thick gold or silver wire. The gravings should be made in a dovetail form, so that the wire which is thrust in may adhere the more strongly. An inferior style of damaskeening can be now produced by the electrotype process. The pattern is etched on the steel and gold or silver deposited into the etched lines.

DAMBONITE (*n'dambo*, native name for the tree), a white crystalline substance existing to the

extent of 0·5 per cent. in caoutchouc, obtained from an unknown tree at Gaboon, in Africa. It is extracted either by cautious sublimation, or by exhausting the dried juice with alcohol. It forms hexagonal crystals, without odour, but with a sweetish taste. It is very readily soluble in water, and in aqueous, but not in absolute, alcohol. On heating it fuses, and with care it can be made to sublime. It does not undergo fermentation. When heated with hydriodic acid it splits up into methylic iodide and a body called *dambose*, which is crystalline and very stable, not being readily attacked by the ordinary strong chemical reagents, and bearing to be heated to 444° F. without decomposing. With sulphuric acid it forms a conjugate acid.

DAMBOOL, or DAMBOLO, a village in the island of Ceylon, at the junction of four lines of road, 70 miles north-east of Colombo. It takes its name from Doombullagalla, a large mass of gneiss and mica schist which rises 550 feet above the surrounding plain, and contains a number of caves, one of them with a long inscription relating to the government of Ceylon in the twelfth century, and another with a colossal statue of Buddha hewn out of the rock. The priests of Buddha still officiate in these cave temples.

DAMIENS, ROBERT FRANCIS, notorious for his attempt to assassinate Louis XV., was the son of a poor farmer, and born in 1715 in the village of Tieulloy in the former province of Artois. His sombre and obstinate disposition early obtained him the name of *Robert-le-Diable*. He enlisted as a soldier, and was afterwards a servant (*cuistre*) in the college of the Jesuits at Paris, but in 1738 left this service in order to marry. He then served in different houses of the capital, robbed one of his masters, a Russian, of 130 louis d'or, and saved himself by flight. He then lived five months at St. Omer, Dunkirk, and Brussels, and expressed himself in the most violent manner concerning the dissensions between the king and the parliament. His mind was disordered when he returned to Paris at the end of 1756. In the beginning of the next year he went to Versailles, took opium for two or three days, and prepared for the crime which he attempted January 5th. As Louis XV. was on the point of getting into his carriage to return from Versailles to Trianon, Damiens stabbed him, although he was surrounded by his train, in the right side. The instrument was a two-bladed pocket-knife: the large blade was long and pointed like a dagger; the small one was only about 4 inches long, yet it was with it he wounded the king. The wound was of a trifling nature. Damiens did not attempt to escape. When questioned he said he never intended to kill the king, which he might easily have done. The most cruel tortures he bore with resolution, and could not be induced to confess that he had any accomplices. He asserted that he should not have committed the act had he been bled, as he requested, and that he thought it meritorious. He was condemned to be torn in quarters by horses, and the sentence was executed March 28, 1757, on the Place de Grève at Paris.

DAMIETTA, a town, Lower Egypt, right bank of one of the principal branches of the Nile, and about 6 miles from its mouth; 100 miles N.N.E. Cairo; lat. 31° 25′ N.; lon. 31° 5′ E. It is irregularly built, but many of the houses are tolerably good, though inferior generally to those of Rosetta; while many of them, again, are of the most wretched description. It contains, however, some fine mosques, bazaars, and marble baths. Damietta was at one time a very important place, and carried on an extensive foreign trade, but is now eclipsed by Alexandria. It still, however, enjoys a considerable trade with the interior in fish and rice—the former the produce of the fisheries on Lake Mensaleh, in the neighbourhood—and exports some coffee, beans, and linen. A bar at the mouth of the Nile prevents large vessels from reaching the town, compelling them to anchor outside, and to load and unload by means of small craft of from 30 to 60 tons burden. Damietta was at one time famous for its manufacture of leather and striped cloths; which last, when imported into Europe, are supposed to have received from it the name of *dimity*. A military school and cotton-factory were established here by Mehemet Ali. The ancient town of Damietta (*Tomeathis*) stood about 5 miles nearer the sea, or further north. It was captured from the Arabs in 860 by the Byzantines, the original possessors, but was soon lost again. It was considered the bulwark of Egypt on this side in the time of the Crusaders, and its capture was always looked upon as the most important object in their expeditions against that country. It was taken in 1166 by Roger of Sicily, and by St. Louis in 1246. The French were compelled to give up the city in consequence of the disastrous issue of that celebrated expedition. The danger to which it was exposed, however, from its position on the shores, induced the Egyptian caliphs to change its position, and to remove it to where the modern town now stands about the year 1251. The present town contains many antique columns and blocks, supposed to have been brought from the old city. It was taken by the Pasha of Egypt in 1833. Pop. 28,000.

DAMMOODA, a river of Hindustan, presidency of Bengal, which rises in district Ramghur, about lat. 23° 55′ N.; lon. 84° 53′ E., and flows first east to Pachete, and then south past Raneegunje, and nearly parallel to the railway between this town and Burdwan. Here it turns almost due south, and continues this direction to its junction with the Hooghly. Its total length is 350 miles. Coal and iron abound in its valley.

DAMOCLES, a native of Syracuse, and one of the courtiers and flatterers of the tyrant Dionysius the elder. His name has become proverbial in consequence of a well-known anecdote related of him as illustrative of the uncertainty of human greatness and felicity. He had been extolling the grandeur and happiness of Dionysius, whereupon the latter invited him to a magnificent banquet, where he would be regaled with regal fare and regal honours. In the midst of the entertainment, however, Damocles happened to look upwards, and perceived a naked sword suspended over his head by a single hair. The sight of this filled him with dismay, and taught him at what a sacrifice of mental peace and personal security the enjoyments and splendours of royalty may be purchased.

DAMON AND PHINTIAS (not *Pythias*), two illustrious Syracusans, celebrated as models of constant friendship. Phintias had been unjustly condemned to death by Dionysius the younger, tyrant of Sicily, but obtained permission to arrange his affairs in a neighbouring place on condition that his friend should remain as a pledge of his return. Damon surrendered himself at the prison, ready to suffer death instead of Phintias if he did not return at a fixed time. Unexpected impediments detained him. Damon, still fully convinced of the faithfulness of his friend, is already on the way to the place of execution; already the people begin to murmur and to pity his credulity, when Phintias suddenly rushes through the crowd into the arms of his friend. While they demand each to die for the other, the spectators melt into tears, and Dionysius himself approaches, pardons them, and entreats them to

admit him a third in their friendship. Schiller has described this adventure in an excellent ballad (Die Burgschaft), and it is the subject of a popular English tragedy.

DAMPERS, certain movable parts in the internal frame of a pianoforte, which, whenever the finger leaves the key, descends upon the wires and instantly checks the vibration. Perfect damping is difficult to obtain, more especially in upright pianofortes; but when it is arrived at there is an immense gain in brilliancy of phrasing and clearness of harmony, and a desirable absence of the confusion of sound inseparable from imperfect damping.—Dampers also denote the iron plates used to regulate the draught of flues.

DAMPIER, William, a celebrated English navigator, was born in 1652. He was descended from a good family in Somersetshire; but losing his father when young, he was sent to sea, and soon distinguished himself as an able mariner. In 1673 he served in the Dutch war, and was subsequently an overseer to a plantation in Jamaica. He next visited the Bay of Campeachy as a logwood-cutter, and after once more visiting England, engaged in a band of privateers, as they called themselves, although in reality pirates, with whom he roved on the Peruvian coasts. He next engaged in Virginia in an expedition against the Spanish settlements in the South Seas. They accordingly sailed in August, 1683, and after taking several prizes on the coasts of Peru and Chili, the party experienced various fortune, but no very signal success. Dampier, wishing to obtain some knowledge of the northern coast of Mexico, joined the crew of a Captain Swan, who cruised in the hopes of meeting the annual royal Manilla ship, which, however, escaped them. Swan and Dampier were resolved to steer for the East Indies, and they accordingly sailed to the Piscadores, to Bouton Island, to New Holland, and to Nicobar, where Dampier and others were left ashore to recover their health. Their numbers gave them hopes of being able to navigate a canoe to Achin, in which they succeeded after encountering a storm, which Dampier has described with great force and nature. After making several trading voyages with a Captain Weldon, he entered as a gunner the English factory at Bencoolen. Upon this coast he remained until 1691, when he found means to return home. He is next heard of as a commander in the king's service of a sloop-of-war of twelve guns and fifty men, probably fitted out for a voyage of discovery. After experiencing a variety of adventures with a discontented crew, this vessel foundered off the isle of Ascension, his men with difficulty reaching land. They were released from this island by an East India ship, in which Dampier came to England. Here ends his own account of his extraordinary adventures; but it seems that he afterwards commanded a ship in the South Seas, as also that he accompanied the well-known expedition of Captain Woodes Rogers as pilot. The date of his death is unknown. Dampier's Voyages in three volumes have been many times reprinted. They are written by himself in a strongly descriptive style, bearing all the marks of fidelity; and the nautical remarks display much professional and even philosophical knowledge. His observations on natural objects are also extremely clear and particular; and he writes like a man of good principles, although he kept so much indifferent company.

DAMPS are certain deleterious gases which are extricated in mines. They are distinguished by miners under the names of *choke-damp* and *fire-damp*. The former is found in the deepest parts of mines. It extinguishes candles, and often proves fatal when it has been suffered to accumulate in large quantities. It consists for the most part of carbonic acid gas. The fire-damp, which prevails almost exclusively in coal-mines, is a mixture of light carburetted hydrogen and atmospheric air, which explodes violently whenever it comes in contact with flame. The gas or after-damp which remains in a mine after an explosion is a kind of choke-damp, and consists of a mixture of carbonic acid gas—produced by the combustion of the carburetted hydrogen—and the nitrogen of the air. It is of course fatal. The injuries which formerly occurred so frequently both to the machinery and to the lives of miners, arising from the fire-damp, are, if due precaution is used, obviated by Sir Humphry Davy's safety-lamp. It consists of a cylinder of wire gauze, about 4 inches in diameter and 1 foot in length, having a double top, securely fastened by doubling over to a brass rim, which screws on to the lamp itself below. The whole of the wire gauze is protected and rendered convenient for carrying by a triangle wire frame and a ring at the top. The wire gauze is made either of iron or copper, the wire being at least one-thirtieth of an inch in diameter, and woven together so as to leave 625 apertures in a square inch. The body of the lamp is of rivetted copper, or of massy cast-brass or cast-iron, the screws fitting so completely as to leave no aperture into the body of the lamp. When the lamp is lighted, it affords the miner all the light which he requires, and renders him perfectly secure, even though entirely enveloped with the explosive mixture which, with an ordinary light, would immediately prove fatal. The first effect of the fire-damp atmosphere is to increase the length and size of the flame. When the carburetted hydrogen forms as much as one-twelfth of the volume of the air, the gauze cylinder becomes filled with a feeble blue flame, but the flame of the wick appears burning brightly within the blue flame, and the light of the wick augments until the inflammable gas increases to one-sixth or one-fifth, when it is lost in the flame of the fire-damp, which now fills the cylinder with a pretty strong light. As long as this explosive mixture of gas exists in contact with the lamp, so long it will give light; and when it is extinguished, which happens when the foul air constitutes as much as one-third of the volume of the atmosphere, the air is no longer proper for respiration; for though animal life will continue when flame is extinguished, yet it is always with suffering. A coil of platinum wire being fixed above the wick of the lamp, within the gauze cylinder, the metal continues to glow long after the lamp is extinguished, and affords a sufficient light to enable the miner to make his escape. The effect of the safety-lamp is supposed to depend on the cooling agency of the wire gauze, exerted on the portion of gas burning within the cylinder. Hence a lamp may be secure where there is no current of an explosive mixture to occasion its being strongly heated, and yet not safe when the current passes through it with great rapidity. But any atmosphere, however explosive, may be rendered harmless by increasing the cooling surface, which may be done either by diminishing the size of the apertures, or by increasing their depth, both of which are perfectly within the power of the manufacturer of the wire gauze.

DAMSON, a variety of the common plum (*Prunus domestica*). The fruit is rather small and oval, and its numerous sub-varieties are of different colours: black, bluish, dark purple, yellow, &c. The tree attains a considerable height, but has a bushy appearance not unlike the sloe. The damson (corruption of Damascene), as its name imports, is from Damascus.

DAN (perhaps from *dominus*, like the Spanish *don*, and the Italian *donna*, from *domina*), the old term of

honour for men, as we now say *master*. It is used by Shakspeare, Spenser, and Prior.

DAN (Hebrew, meaning *judgment*), one of the sons of Jacob by his concubine Bilhah. Like the other sons of Jacob, Dan became head of one of the twelve tribes of Israel. At the time of the exodus the Danites numbered 62,700 adult males, being then the second tribe in point of numbers. The territory assigned them in Canaan lay on the coast, having parts of Judah and Benjamin on the east, Ephraim on the north, and Simeon on the south. But living in the immediate neighbourhood of the hardy and well-equipped Philistines—for the district lay partly within the Philistine territory—the available land proved somewhat too narrow for the Danites, and they were pushed back into the more mountainous region, where they encroached on the boundaries of Judah. The tribe also possessed an isolated portion of territory in the extreme north of Canaan, containing the town of Laish or Dan, which gave rise to the proverbial expression 'from Dan to Beersheba.' This town was in later times selected by Jeroboam as one of the two centres of his idolatrous worship, but a species of idolatry had been maintained there from the earliest times of the settlement in connection with the image of Micah. The most notable person connected with the tribe was Samson.

DANAE, in Greek mythology, daughter of Acrisius, king of Argos. She was shut up by her father in a brazen tower, because an oracle had declared that a son of his daughter should put him to death. But Zeus, inflamed with passsion for the charming virgin, transformed himself into a golden shower, and descended through the apertures of the roof into her embraces. When Acrisius discovered that his daughter had become a mother he exposed her with her child, in a frail boat, to the violence of the waves. But the sea-goddesses, anxious for the preservation of the son of Jove, commanded the billows to waft the skiff safely to Seriphos, one of the Cyclades. Polydectes, or rather Dictys, the governor of the island, received her, and educated the child, which he named Perseus.

DANAIDES, in fabulous history, the fifty daughters of Danaus, who was a son of Belus, and at first lived in Libya with his brother Ægyptus, who had fifty sons. In consequence of a quarrel with his brother, Danaus, with his daughters, fled to Argos. The fifty sons of Ægyptus followed him thither, expressed a desire for a reconciliation, and asked the daughters of Danaus in marriage. He was obliged to consent to the proposal; but as he put no confidence in his nephews, and had, moreover, been informed by an oracle that one of his sons-in-law should slay him, he bound his daughters, by a solemn oath, to murder their husbands on their bridal night. They all kept their promise except Hypermnestra, who saved the life of her husband Lynceus. As a punishment for their crime, the daughters of Danaus, in the infernal world, were condemned perpetually to draw water in sieves.

DANBY, Francis, an eminent painter, was a native of Ireland, and born near Wexford on 16th November, 1793. He studied his profession at the Dublin Academy of Fine Arts, and sent to its exhibition his first picture in 1812. In 1820 he settled at Bristol, and the following year contributed a picture to the Royal Academy's exhibition, entitled Disappointed Love. He established his reputation in 1823 by his Sunset at Sea after a Storm; and in 1825, by his Delivery of Israel out of Egypt, obtained the honour of being admitted as an associate of the Academy. Among his subsequent pictures the most celebrated are the Opening of the Sixth Seal, exhibited in 1828; the Age of Gold, in 1831; The Enchanted Island—Sunset, in 1841; The Contest of the Lyre and Pipe in the Vale of Tempe, in 1842; and the Painter's Holiday, in 1844. Danby's excellence lay in his delineations of scenery, and the poetic halo with which he contrived to invest them. He settled latterly at Exmouth, and died there on 17th February, 1861.

DANCE OF DEATH. See Death (Dance of).

DANCING. The disposition to rhythm and measured motion is deeply implanted in human nature. As soon as man in a rude state wishes to express elevated feelings, whatever be their cause—joy, devotion, patriotism—he makes use of rhythm, of measured language; and the dance, or measured movements. This is the origin of the symbolical dance, which, among all nations in the first stages of civilization, is used as an expression of excited feeling. The operation of the principle of imitation, which led to the invention of the drama, gave birth also to the imitative dance—the pantomime. Dancing, in the course of time, took the character of an art. Grace became one of its chief objects, and it was much cultivated as an elegant amusement in the intercourse of society, and an elegant spectacle in public entertainments. Its ancient character, however, of an expression of religious or patriotic feeling gradually declined, as the progress of refinement and civilization produced its invariable effect of restraining the full expression of the feelings and emotions. This circumstance, added to the chastened and didactic character of the Christian religion, probably prevented the dance from being admitted among the rites of Christianity; but it has always been cultivated among Christians, as an agreeable amusement and elegant exhibition. As an amusement of social assemblages, the dance has sunk much below the character of an art. The assemblies of the present day are too much crowded to leave room for graceful dancing. But national dances as those of the Bohemian, Polish, Hungarian, Italian, and Spanish peasantry, still retain the expression of joyous feeling, and often exhibit much imitative power.

There is reason to suppose that the dance had a place among the religious rites of the Jews; to what extent, however, is not known, and some persons deny the fact altogether; but it appears pretty evident that this doubt is unfounded, and the admission of dancing as a rite may be easily explained by the origin which we have ascribed to dancing in general. With the Greeks and Romans, regulated movements, quick or slow, that is, dancing, were introduced in most religious celebrations. The Greeks, developing the element of the beautiful in every branch of art, were also masters in the religious dance. In the exhibitions of the theatre they united the dance with many other performances, and the dances of the ancients which commemorated the adventures of Achilles, Alexander, the loves of Venus and Mars, &c., are to be understood as pantomimic performances, the word *saltare*, with the Romans, having a very extensive meaning, and *orchesis*, with the Greeks, including the mimic art in general. The Roman citizens took no part in the profane dance themselves; but, like the orientals, left it to the hired slaves. But under the empire dancing and pantomime attained a high degree of perfection. From the Romans the dance was transmitted to the national theatre of the Italians. As early as the sixteenth century several Italians (Rinaldo Corso, Fabric. Caroso, &c.) wrote on dancing. They and the French have cultivated the modern art of dancing to the degree of perfection in which we find it; so that the ballet of the Parisian opera was long considered the highest perfection of the art of dancing, and in some respects still is. There exist

at present two different schools—the Italian and French. Of the two, the Italian is the least artificial. The modern French ballet sometimes degenerates to a mere display of skill and agility at the expense of grace and beauty, which ought always to remain the chief object of dancing.

As a social amusement, something can be said both for and against dancing. It is a pleasantly animated indoor physical exercise; it imparts grace to the ordinary movements of the body, and is one of the means, although the lowest, of destroying that awkward and painful diffidence characteristic of the young of both sexes when thrown together at a social party. It can be urged against it that, as an exercise, it takes place most frequently when the body should be in repose, and under circumstances not very favourable to health—such as overcrowded and overheated rooms, &c. It can scarcely be denied either that as a recreation it is one of those most particularly liable to abuse, more especially when indulged in in the promiscuous assemblies in our larger towns.

DANCING DISEASE, an epidemic nervous disorder, apparently allied to hysteria and chorea, occasionally prevalent in Germany and Italy during the middle ages. In the last-mentioned country the disease was ascribed to the bite of a spider called the tarantula; but as scarcely any of those affected with it had any consciousness of being bitten by a spider or any other insect, and as it has been in every instance chiefly propagated by physical contagion, like chorea, there is every reason to conclude that it had a like origin. In 1734, during the celebration of the festival of St. John at Aix-la-Chapelle, the streets became crowded with men and women, of all ranks and ages, who commenced dancing in a wild and frantic manner, many losing entire control over themselves, and continuing to dance until dropping down from fatigue, and some, in a moment of frenzy, dashing out their brains against walls. The mania spread to Cologne, Metz, and Strasburg, and gave rise to much imposture, profligacy, and disorder. At the beginning of the seventeenth century the epidemic began to decline; and is only known now as a nervous affection in individual cases.

DANCOURT, Florent Carton, a French actor and comic poet, born in 1661, at Fontainebleau, of a respectable family. At the age of twenty-three he became enamoured of an actress, and left every other employment for the stage. Although he personated the first characters in high comedy, he succeeded best as an author in low comedy. He displayed much ingenuity and wit in introducing upon the stage amusing subjects of real occurrence in his time. Louis XIV. was very fond of humorous pieces, and Dancourt often used to read his productions to the king before they were played. He left the theatre in 1718, and died in 1725. A good edition of his complete works appeared in twelve volumes 12mo, 1760.

DANDELION (*Leontodon taraxacum*), the name of a plant belonging to the natural order *Compositæ*, indigenous to Europe, but now also common in America. The leaves are all radical and runcinate, or jagged on the margin. From this circumstance has been derived its French name *dent de lion* (lion's tooth), of which the English appellation is a corruption. The stems are hollow, and bear single large yellow flowers, consisting of a congeries of florets, each of which is succeeded by a naked seed bearing on a long pedicel a tuft of radiated down. By means of this tuft the seed, when detached, is kept suspended in the air, and transported by the winds to a distance. The whole plant is full of a milky and bitter juice (see Taraxacin). The young leaves are frequently used, when blanched, as a salad; and a powder or extract of the root is largely mixed with coffee in some parts of Germany.

DANDOLO, Andrea, Doge of Venice, and one of the earliest Italian historians, was born about 1310, and made doge in 1343. He carried on a war against the Turks with various success, and greatly extended Venetian commerce by opening a trading connection with Egypt. The jealousy entertained by the Genoese of this new trade produced a war between the two states, which gave rise to a correspondence between the doge and Petrarch, who exhorted him to peace. He died in September, 1354. To Andrea Dandolo is ascribed the compilation of the sixth book of Venetian statutes; but he is most distinguished for his Chronicle of Venice, which is written in Latin, and comprehends the history of the republic from its commencement to 1342. It is praised for its impartiality, and for its judicious use of authentic documents, and was first published by Muratori in his collection of original Italian historians.

DANDOLO, Enrico, one of the most illustrious of the doges of Venice, was chosen to that office in 1192, at the advanced age of eighty-four. He had a defect of sight approaching nearly to blindness; but neither that circumstance nor his age impaired the vigour of his administration, the events of his government being among the principal causes of the Venetian greatness. On the formation of the league for the fourth Crusade, under Baldwin, earl of Flanders, Dandolo induced the senate to join in it, and by his policy the first hostilities of the armament were directed against Zara, which had revolted from Venice. On the storming of Constantinople, the aged doge, it is said, was the first who mounted the walls. On the Crusaders proceeding to the election of a new emperor of the city Dandolo was first nominated; but in consequence of his age, and the incompatible character of doge, he declined, and the choice ultimately fell on Baldwin. In the sharing of the imperial dominions Venice obtained a full moiety, and Dandolo was solemnly invested with the title of *Despot of Romania*. He ended his eventful life at Constantinople in 1205, at the advanced age of ninety-seven.

DANEBROG, the Danish national flag (*brog* simply meaning cloth), which was carried at the head of the army, like the oriflamme of France. It is red with a white cross in the centre, and, as the legend has it, fell from heaven, as an omen of victory, when the pious Danes under Waldemar II. were besieging the pagan town of Reval. In memory of this auspicious event the king founded the order of the Danebrog, which fell into abeyance however at a later period. In 1671, under Christian V., and again under Frederick VI., it was revived, and the circle of its recipients greatly extended. It may be conferred upon all ranks, and may be awarded for military or civil services. The decoration consists of a white enamelled gold cross, suspended by a white ribbon with a red border.

DANEGELT (from the Saxon *gelt*, money), an ancient annual tax of the Anglo-Saxons, to maintain forces to resist the Danes. It was first paid in 991 when Ethelred purchased the retreat of the invaders, who had reached as far as Maldon. The tax was continued until the time of Stephen as one of the rights of the crown.

DANELAGH, the ancient name of a strip of territory extending along the east coast of England from the Thames to the Tweed, ceded by Alfred to Guthrun, king of the Danes, after the battle of Ethandune. This name (Danelagh or Dane-law) it retained till the Norman conquest, its inhabitants governed by a modification of Danish law and not by English law.

DANEWERK (Danes' work), an ancient wall of about from 30 to 40 feet high and of an equal thickness, constructed of earth, stone, and wood, about the middle of the tenth century, with the intention of keeping back the Saxons. It extends along the southern frontier of Schleswig for a distance of nearly 10 miles, and being defended by a series of forts the Danes relied upon it checking the approach of the German troops during the Schleswig-Holstein war of 1864. It was soon discovered that their army was too weak for the defence of so extensive a line, and the position was abandoned. The wall was soon after levelled to the ground.

DANIEL, the prophet, a contemporary of Ezekiel, was born of a distinguished Hebrew family. In his youth, B.C. 600, he was carried captive to Babylon, and educated in the Babylonish court for the service of King Nebuchadnezzar. After three years he entered into the service of this monarch, and discharged his employments with much credit to himself, and without violating his conscience. A decree of the king which he could not conscientiously obey occasioned his being thrown into the lion's den. Preserved by a miraculous providence he lived afterwards in happiness and honour. He was elevated to the office of governor and prime minister in the court of the Persian King Darius. Cyrus finally gave him permission to return with his people to Palestine. Daniel was a man of high mental cultivation and strict virtue. According to the traditions of the Rabbins, he returned from Palestine to Babylon, died there, and was buried in the royal sepulchre. He ranks with what are called the 'greater,' in contradistinction to the twelve 'minor' prophets. His work, which bears his name, and holds a place in the canon of the Old Testament, is written partly in the Chaldee dialect; and besides historical details, contains several most remarkable visions and prophecies. The latter in particular so evidently refer to events long afterwards fulfilled, as to place the inspiration of Daniel beyond all dispute.

DANIEL, GABRIEL, one of the French historians, was born at Rouen in 1649. At the age of eighteen he entered the Jesuits' College, instructed in several places with much success, and died in 1728. His Histoire de France appeared first in 1713 (three volumes folio), another edition, carefully revised and improved, in 1755–60 (seventeen volumes 4to). The book contains a pretty exact narrative of all important military events, and is written so as to flatter the court, the nobility, and the clergy. We often feel the want of profound research and historical fidelity in his work. He seems to have been destitute of the art of historical description. His thoughts on the proper mode of writing history, he has given to the world in the somewhat tedious introduction to his prolix narrative. His Histoire de la Milice Française is still known: less so is his Recueil des Ouvrages Philosophiques, Théologiques, Apologétiques, &c. (1724, 4to), which contains his Voyage du Monde de Descartes (first published separately, and translated into English and Italian)—a caustic satire on the opinions of this philosopher.

DANIEL, SAMUEL, an English historian and poet, contemporary with Shakspeare, was born in 1562. He was the son of a music master, and was educated at Oxford, under the patronage of the Pembroke family. He had an appointment at the court of Queen Elizabeth, and also of Ann (wife of James I.); but he commonly lived in the country, employed in literary pursuits. As an historical poet Lucan seems to have been his pattern. He bestowed much labour on the poem which describes, in eight books, the civil wars between the houses of York and Lancaster (History of the Civil Wars between the Houses of York and Lancaster. The poetical value of this work, as of Lucan's, consists in a beautiful style. Daniel contributed much to the improvement of the poetical diction of England. His stanzas, formed with a careful attention to the Italian octave, have more dignity and euphony than most verses of this sort in English literature in the first half of the seventeenth century. He is not wanting in rhetorical beauty and force. He was also the author of some poetical epistles, pastorals, fifty-seven sonnets, and a few tragedies. The first seem to have excited much attention. During the reign of Queen Elizabeth he wrote a sketch of the history of England till the time of Edward III.—a work learned and clear, without ostentation, and containing useful and acute views. Daniel died in 1619.

DANIELL, JOHN FREDERICK, born at London, March 12, 1790, entered into business as a sugar-refiner, but soon relinquished it for scientific pursuits, and in 1814 became a fellow of the Royal Society. In 1816 he commenced the Quarterly Journal of Science and Art in concert with Mr. Brande, with whom he had originally been a pupil, and was joint-editor of the first twenty volumes. From this period scarcely a year elapsed without his furnishing some important contribution to chemical or meteorological science. In 1820 he published an account of a new hygrometer which he had invented, and is much more perfect than any which previously existed; and in 1823 appeared the Meteorological Essays, which added greatly to his fame, and still form a standard work. In 1824 his essay on Artificial Climate was rewarded with the silver medal of the Horticultural Society. It has led to many important improvements in the modes of artificial culture. In 1831 he was appointed professor of chemistry in King's College, London, and shortly after invented a pyrometer for measuring high temperatures, and was rewarded in 1832 by the Rumford medal of the Royal Society. He now turned his attention chiefly to voltaic electricity, and in 1836 communicated a paper to the Royal Society, tracing the cause of the rapid decline of power in the ordinary voltaic batteries, and pointing out the means of maintaining a powerful and continuous current of electricity for an unlimited period. The apparatus he contrived is known by his name, and is still one of the best of all forms of galvanic battery. The Royal Society showed the importance attached to this discovery by awarding to it the Copley medal. In 1839 he published an excellent Introduction to Chemical Philosophy, and in 1842, for two important papers on the theory of salts, obtained one of the Royal medals. He is thus one of the few men who have received the three medals in the gift of the society. In 1843 the degree of D.C.L. was conferred on him by the University of Oxford, and for several years he filled the office of foreign secretary to the Royal Society. On March 13, 1845, while attending a meeting of the council of the society, he was struck down by an apoplectic fit and almost instantly expired. Among his different works that in connection with the water-barometer, in the possession of the Royal Society, is one of the most curious. The tube was drawn in the Falcon Glass Works, and measured 40 feet in length, with an internal diameter of about an inch. It was made with great dexterity, was cylindrical, and almost absolutely uniform throughout its whole length. It was filled with thoroughly-boiled distilled water from a copper boiler, which acted as a reservoir, and access of air was cut off by a layer of oil. When the tube was filled, it was sealed hermetically. Numerous observations with it were made, and its sensitiveness to the smallest change of pressure was very noticeable. Subsequently air got

into it, and it had to be refilled. This was done under Daniell's supervision two or three months before his death.

DANIELL'S GALVANIC BATTERY. In this arrangement, which is the best and most important of all the forms of constant batteries, the cells were originally constructed in the following way. A tall cylindrical copper vessel was nearly filled with saturated solution of sulphate of copper. A rod of amalgamated zinc was inclosed in a skin or bladder, which was filled with dilute sulphuric acid, and was suspended in the copper cylinder. When the zinc rod is connected by a wire with the copper vessel, which itself forms one of the plates of the battery, the current passes, according to common phraseology, from the copper through the wire to the zinc. Instead of the bladder or skin porous earthenware pots are now employed to contain the dilute sulphuric acid in which the zinc is immersed.

The following is the nature of the chemical reactions that take place during the action of the battery. The sulphuric acid attacks the zinc forming sulphate of zinc and liberating hydrogen. This gives rise to a second reaction at the surface of the porous cell, by which hydrogen, set free at this place by reason of the first, attacks the sulphate of copper, re-forming sulphuric acid and liberating copper. A third reaction takes place at the surface of the copper plate, copper being deposited there. The nature of these contemporaneous reactions is explained under GROTTHUSS' HYPOTHESIS. The following two lines will help to explain them by means of chemical symbols. The first line represents the condition before chemical action begins, the second the condition after one series of changes has taken place. The vertical line in middle is the porous diaphragm—

Copper plate $Cu,\widehat{CuSO_4},\widehat{CuSO_4}$, | $\widehat{H_2SO_4},\widehat{H_2SO_4}$, Zn, Zinc plate.
Copper plate $\widehat{Cu},Cu,\widehat{SO_4}Cu,\widehat{SO_4}$ | $H_2,\widehat{SO_4}H_2,\widehat{SO_4}Zn$, Zinc plate.

The sulphuric acid formed at the porous partition diffuses towards the zinc plate. It will be observed that, during the reactions described above, sulphate of copper is used up. It is very important for the sake of the constancy of the battery that the solution in the outer cylinder should be kept perfectly saturated, and for this purpose there is attached to the upper part of the vessel a shelf perforated with holes. Crystals of sulphate of copper are placed on the shelf, and these gradually dissolving keep the liquid saturated.

There are several modifications of Daniell's battery which are preferable practically to the original form, and which are largely employed for telegraphic purposes. The most important change is that of substituting for the dilute sulphuric acid that surrounds the zinc, solution of sulphate of zinc, and in this case the zinc is not amalgamated. By doing away with the sulphuric acid local waste of the zinc is to a great extent prevented, and the solution of sulphate of zinc is used instead of pure water on account of the very high resistance of water impregnated with salts. Sir William Thomson has formed a Daniell's battery of improved construction with eighty cells of which he is able to display a constant electric light for hours, or if necessary for weeks or months, together. This is a very important step; for it is the first time that a battery has been constructed which combines together high electromotive force, small resistance, and really permanent constancy.

DANISH LANGUAGE, LITERATURE, AND ART. See DENMARK.

DANKALI, OR DANAKIL (the former is the Arabic singular, the latter the plural), the common name of a number of rude tribes that inhabit the Abyssinian coast district of Samhara from the peninsula of Buri (S.E. of Massowa, in 15° N. lat.), southwards beyond the Strait of Bab-el-Mandeb to the bottom of the Gulf of Tajurra (lat. 11½° N.), where they border with the Somalis. In former times they were united into one kingdom, but the tribes are now independent of each other, and each under a chieftain of its own. Some of the tribes engage in fishing, the others devote themselves to the pasturage of cattle. They profess the Mohammedan religion. Their country is bounded toward the interior by a mountain range nearly parallel to the sea; length, about 250 miles; breadth, where widest, 56 miles; population estimated at 70,000. They possess also the Dhalak Islands in the Red Sea.

DANNECKER, JOHANN HEINRICH, one of the most celebrated German sculptors of modern times, was born of humble parentage at Waldenbach, in the bailiwick of Stuttgard in 1758. His intelligence and decided turn for drawing and painting recommended him to the attention of Charles, duke of Würtemberg, and procured his admission, though contrary to his father's wish, into the then newly erected Karlschule at the Solitude. Here, where he had Schiller for a fellow-student, he devoted himself so successfully to sculpture that a statue of Milo of Crotona, executed in his seventeenth year, excited great admiration. On leaving the school he was appointed court sculptor, and three years after visited Paris and Rome. In the latter city he executed a Ceres and Bacchus, which procured him admission into the academies of Bologna and Milan, and also laid the foundation of a friendship with Goethe and Herder, which was terminated only by death. In 1790 he returned to Würtemberg, and became professor of the fine arts at Stuttgard. From this period he continued his professional labours with the most brilliant success, and was patronized by the most distinguished personages in Germany. Among his most successful works are busts of King Frederick of Würtemberg, Prince Paul, Schiller, Lavater, and the Duchess Stephanie of Baden, but his acknowledged masterpiece is a statue of Christ, which occupied him during eight years, and the prototype of which is said to have been suggested to him in a dream. His Ariadne seated on the Panther is a splendid work, and in the opinion of some critics is superior as a work of art to his Christ. As a sculptor he occupies an intermediate place between Canova and Thorwaldsen, having blended in the happiest manner the spirited conception of the former with great anatomical skill, careful execution, and nice appreciation of nature. Several years before his death, oppressed by too close application, his physical and mental health began to suffer; but although an apparent improvement in the former took place, he never fairly regained the use of his mental faculties. He died in 1841.

DANNEMORA, a straggling village, on a lake of the same name, 24 miles N.N.E. of Upsala, in the district of Upland, Sweden. It is celebrated for its iron mines, the second richest in Sweden, which have been worked uninterruptedly for upwards of three centuries, and produce the finest iron in the world. The mine has been sunk more than 100 fathoms, and as part of the workings runs under the lake, great trouble is sometimes experienced in keeping out the water. The total quantity of ore raised is about 25,000 tons per annum. It consists of 86 to 90 per cent. magnetic oxide of iron, 7 to 12 per cent. silica, and traces of manganese, lime, magnesia, and alumina, the earthy matters being in the proportion to form a fusible slag without further addition. It is almost free from sulphur and phosphorus, and as the charcoal fuel employed in smelting is also free from these impurities, the Dannemora iron enjoys the

highest reputation, and is in great request for conversion into steel.

DANTE (a contraction of *Durante*) ALIGHIERI, the greatest of Italian poets, was born in Florence about the end of May, 1265, of a family belonging to the lower nobility, and of mixed descent, the Aldighieri, or Alighieri, being originally Teutonic. He lost his father in early life (certainly before his ninth year), but his mother, Bella, whose praises are frequently on his lips, watched carefully over his education, which was confided to the eminent philosopher and statesman, Brunetto Latini. He is said to have studied at Bologna, Padua, Naples, and even Paris and Oxford, but we have no means of confirming the statement in any measure. What is tolerably certain is that he had mastered the learning of that age. He was a musician and painter, a theologian and linguist of no mean order. Many of his biographers state that it was in 1274, when nine years of age, that he saw for the first time, and ever afterwards devotedly loved, Beatrice Portinari. Others affirm that that event took place shortly before her death, in 1290, three years after she had married a noble Florentine, Simone Bardi. His love for her awakened in him a new life; all the powers of his soul were to be henceforth devoted to immortalize her, and we can watch the struggles of his spirit in that record he has left us of his early years, the Vita Nuova. About the period when Dante reached the age of manhood the Guelfs (the Papal or church party) were predominant in Florence, whence they had, aided by the pope and Charles, king of Naples, driven the Ghibellines (the imperial or state party). At Arezzo, on the other hand, the Ghibellines had succeeded in exiling the Guelfs, who implored the assistance of their Florentine friends. A war was declared between the two cities, which was terminated by the battle of Campoldino (June, 1289), in which the Ghibellines were defeated. Dante was there fighting bravely, and contributed not a little to the victory of the Guelfs. In 1291 he married Gemma dei Donati, a daughter of one of the most powerful families of the state, and which belonged to the Guelf faction. By this lady he had seven children, the youngest, Beatrice, being born about 1301. In 1293 a revolution broke out in the city, headed by Giano della Bella, whereby the priors of the trades took the power into their own hands, and made nobility a disqualification for holding office. The following year, however, Giano della Bella was deprived of power, and the nobles disagreeing among themselves, and splitting up into two factions, the Bianchi and the Neri (the White and the Black), the streets of Florence were continually the scenes of sanguinary fights. In order to check the excesses of the greater nobles, a number of the lesser nobility, Dante among them, threw in their lot with the citizens' party. In order to render himself elegible for office Dante had his name inscribed in the books of the physicians and apothecaries, and in June, 1300, he was nominated a prior of the trades, one of the highest offices in the state. Although leagued by marriage to the Guelf side, Dante was no rampant partisan, and on one occasion, when roused by some fresh act of atrocity, he proposed and carried a law to the effect that the heads of the Bianchi and Neri parties should be temporarily banished. From what we can gather it appears that the Bianchi and Neri were originally Guelfs, but that the latter were the extreme Papal party, and the former leaned towards a reconciliation with the Ghibellines. Dante's sympathies were with the Bianchi, and on the too hasty return of one of the exiles, Guido Cavalcanti, a friend of the poet's, and one of the Bianchi, Dante was charged with undue partiality in permitting him to remain in the city. The Neri wrote to the pope that the Bianchi were making common cause with the Ghibellines, and Boniface VIII. sent Charles of Naples to occupy the town, and keep down the turbulent spirit of the Florentines. The Neri were allowed, however, to commit the greatest excesses unchecked by Charles: many of their rivals were slain in the open street, and their houses burned to the ground; among others that of Dante, who had been sent to Rome by his party to try to influence the pope in their behalf. Taking advantage of his absence, his enemies obtained a decree of banishment against him, together with the heads of his party, and he was further condemned to pay a fine of 8000 florins, or have his property confiscated (January, 1302). Two months later a second sentence was launched against him and several of his friends: they were condemned to be burned alive for malversation, peculation, and usury. The fine he refused to pay, as it would imply a confession of guilt.

From this time forth the life of the poet becomes semi-mythical. We find some traces of him first at Arezzo, then at Sienna, then at Verona. He himself says, 'Through almost all parts where this language (the Italian) is spoken, a wanderer, well nigh a beggar, I have travelled, showing against my will the wounds of fortune.' His sympathies now lay entirely with the Ghibelline party. The expedition of the emperor, Henry VII., into Italy (1310) roused the hopes of Dante to the highest pitch. He wrote the emperor that famous letter advising him first of all to crush the Hydra, Florence, as being the cause of all the misfortunes of Italy. Henry, however, spent his time in foolish inactivity till death put an end to his career in 1313. Shortly after this event Dante is said to have visited Paris; but according to Balbo he spent the year 1313–14 in Pisa and Lucca, and then took refuge with Can Grande della Scala at Verona, where he remained till 1318. In 1316 Florence sent forth a decree permitting the exiles to return on conditions of fine and penance, which Dante indignantly refused. In 1320 we find him at Ravenna staying with his friend Guido Novello da Polenta. In the following year, on his return from an embassy to Venice, his wanderings and sufferings were ended by death (13th or 14th September, 1321). He was buried in the Church of the Minorites, under a monument built by his friend Guido Novello, on which was an epitaph written by Dante himself. Such, imperfectly sketched, was the career of the great poet; by it he gained a sense of the nothingness of earthly honours and prosperity possible only to the rich, and a knowledge of man possible only to the poor. In his youth living amidst the excitement of the tented field and penning sonnets to his adored Beatrice; in his old age compelled 'to climb the stranger's toilsome stairs, and eat the bitter bread of others.' Out of his misfortunes the world found her rich account; the apocalypse of the middle ages, the Divina Commedia, was begun and finished in his years of exile. Of this grand poem we can only give a very brief analysis. It is divided into three parts: Hell, Purgatory, and Heaven. Each part is subdivided into thirty-three cantos, in allusion to the years of our Saviour's life, the extra canto in the first part being introductory. Dante dreams that he had 'reached the half-way point in his path of life, at the entrance of an obscure forest.' He would advance, but three horrible beasts bar the way; then the shade of Virgil appears and offers itself as his guide. Dante accepts, and then takes place that wondrous journey in the 'world of souls.' Virgil tells him he can only accompany him through hell and purgatory; but that Beatrice shall conduct him through those happy spheres, the portals of which a pagan may not

enter. Now commences the peregrinations of the Florentine through the regions of the damned, over the entrance of which is written the awful words—'All hope abandon ye who enter here.' This is the most impressive and best known part of the poem: the singular diversity of the chastisements; the rapidity with which Dante passes in review the great criminals of history; the intensity with which he paints, at a single dash, so to speak, their distorted features; the grace of certain episodes (the adventure of Francesca di Rimini, the death of Ugolino, and that of Manfred), attest a vigour of imagination never surpassed, if ever equalled. From Hell (which the poet places in the centre of the earth) he ascends to Purgatory, which is a solitary mountain rising from the ocean on the side of the globe opposite to us. This mountain is divided into terraces, and its top is the terrestrial paradise, the first abode of man. In purgatory there are still scenes of pain and suffering; but these punishments are only temporary. The poet hesitates when he comes to a path filled with a sheet of flame; but Virgil speaks: 'Between Beatrice and thee there is but that wall.' Dante at once plunges into the heart of the flames. The two poets have now reached the earthly paradise, and behold Beatrice surrounded by a scene of surpassing magnificence; noble forests, whose trees are gently moved by celestial zephyrs; the melodious songs of birds to which the murmuring of the sacred woods and streams give harmonious reply; meadows of the freshest green, and groves of deepest shade. From this enchanting region Dante ascends, faster than tongue or pen can tell, into the celestial paradise. This realm consists of ten heavens or circles. Dante roams at first over the seven planets, the Moon, Mercury, Venus, the Sun, Mars, Jupiter, and Saturn; then he enters the eighth sphere, and at last into the empyrean. Each of these globes has its inhabitants, who are souls or spirits. Arrived at the eighth sphere, he looks down upon our globe; but the earth appears so abject that he smiles with pity upon it. Beatrice calls his attention to a nobler scene. 'See the glorious company which surrounds the triumphant Redeemer.' The eyes of the poet cannot sustain the splendour of the view. In the ninth sphere Dante feels himself in the presence of the Divine essence, hid from his sight by three hierarchies of angels. He sees the souls of the blessed on thrones in a vast amphitheatre, whose steps and circles widen into infinity. Beatrice takes her place upon her throne of glory; from that sublime height she smiles benignantly down upon the poet; then turns towards Him who is the source of life and light. Thus ends the Divine trilogy, the noblest effort of the middle ages.

The name *Commedia* is derived from Dante's idea concerning the forms of eloquence, which were in his opinion tragic, comic, and elegiac, as he relates in his work De vulgari Eloquio, which was first written in Latin. What he called *tragedy* was a piece commencing with happy and peaceful scenes, and ending with events of a painful and terrible character; and what he called *comedy* was a piece which, beginning unpleasantly, terminated happily. The qualifying word *divina* was, however, added by others. We may mention the opinion maintained in 1753 by Bottari, that Dante made use of the Vision of Alberico, a monk who lived in the twelfth century, in a monastery on Monte Cassino, in Naples. There have been many such visions from the earliest ages of Christianity; as, for instance, the Vision of an English monk, which Matthew Paris mentions in his History of England (in the year 1196), and which resembled Dante's poem much more than the Vision of Alberico published by Cancellieri in 1814 at Rome, with observations (Osservazioni intorno alla Questione sopra la Originalità della Divina Commedia di Dante). It is possible that Dante here and there may have borrowed a thought or image from those visions; but this is no fault: the recollections of great men are sparks which serve to kindle mighty flames.

There is no poet who bears so distinctly the impress of his age, and yet rises so high above it, as Dante. The Italians justly regard him as the creator of their poetical language, and the father of their poetry, which, regulated and controlled by his genius, at once assumed a purer and far nobler form than it had previously worn. The terzina first reached its perfection in the time of Dante, on which account he has been erroneously regarded as the inventor of it.

Florence soon recognized that she had lost her noblest son. In 1350 a sum of ten golden florins was ordered to be paid by the hands of Giovanni Boccaccio to Dante's daughter, Beatrice, a nun in the convent of Santa Chiara at Ravenna. In 1373 an annual sum was granted for public lectures, to explain the Divine Comedy in the churches, and Boccaccio was one of the first lecturers. A monument was voted for if Ravenna would give up the now sacred remains, which that city refused, and has repeatedly refused to do. In May, 1865, all Italy assembled at Florence to render homage to the seer who prophesied so confidently her unity; and the following year a colossal statue of the poet was erected on the Plazza della Croce.

The best editions of the Divina Commedia are those of Lombardi (Rome, 1791, three vols. 4to, frequently reprinted with valuable improvements), of Viviani (1823), of Bianchi (fifth edition, Florence, 1857), of Karl Witte (Berlin, 1862), &c. In 1821 Luigi Fantoni published an edition of the Divina Commedia, stated to have been printed from a manuscript in the hand-writing of Boccaccio. In 1869 the Vernon Dante was published in London by Lord Vernon, in three large vols. folio. It contains the text of the Inferno, and, in Italian, an explanation of everything in the text regarding which any reader might have the least difficulty; together with an immense mass of information—biographical, topographical, historical, &c., relating to the life and times of Dante, and a large number of maps, plans, and illustrative plates. Dante's complete works appeared at Venice in 1757–58, published by Zatta (in five vols. 4to). His lyric poems, sonnets, and canzonets, of which some are beautiful, others dull and heavy, were written at different periods of his life. We have yet to mention his Banquet (Il Convito)—a prose work worthy, says Bouterwek, to stand by the side of the best works of antiquity. It contains the substance of all his knowledge and experience, and thus illustrates his poetry and his life. There is a good English translation of the Divina Commedia by Mr. Cary in blank verse; another by Mr. Wright in triple rhymes; and a third by Mr. Cayley in the original metre. The German translations are numerous, and surpass those of every other modern language in faithfulness and force. The translation by Kannegieser is in the measure and rhyme of the original; that of Philalethes (King John of Saxony) has a deservedly wide reputation. The French have four or five translations, including one by Lamennais, but that graceful and feminine tongue is incapable of doing anything like justice to the manly thoughts of Dante.

In one respect Dante stands unrivalled by any man, as he, we might almost say, created the language, which he elevated at once to its highest perfection. Before him very little was written in Italian, Latin being the literary language; but no one attempted to use the *lingua volgare* for the

purposes of dignified composition. The poet, indeed, thought it necessary to excuse himself for having written in Italian after having attempted to compose his poem in Latin. Thus he is to be regarded as the founder of Italian literature. One of the strangest productions of Dante is his De Monarchia. He labours in this work to prove that the emperor ought to have universal authority, and draws his arguments from the sacred Scriptures and from profane writers, which in this book appear very often with equal authority. The dialectics of the schoolmen are here exhibited in a most characteristic way. The De Monarchia is valuable as a source of information respecting the great struggle of the Guelfs and Ghibellines, and its influence upon the Christian world at that time. This struggle was a part of the great convulsion attending the separation of the civil power from the ecclesiastical, with which in the earliest ages it is always united. On the whole Dante's works are important chiefly in three respects —as the productions of one of the greatest men that ever lived, as one of the keys to the history of his time, and as exhibiting the state of learning, theology, and politics in that age. To understand Dante it is necessary to be acquainted with the history and spirit of his time, particularly with the struggle of the Guelfs and Ghibellines, the state of the north of Italy, and the excitement caused by the beginning of the study of the ancients; also to have studied the Catholic theology and the history of the court of Rome, and to keep always in mind that Dante was an exile, deprived of home and happiness. The personal appearance and character of the man are thus described by Boccaccio:—Our poet was of middle height; his face was long, his nose aquiline, his jaw large, and his under lip protruding somewhat beyond the upper. His eyes rather large than small; his hair and beard thick, crisp, and black, and his countenance sad and pensive. His gait was grave and gentlemanlike, and his bearing, in public or private, wonderfully composed and polished. In meat and drink he was most temperate. Seldom did he speak unless spoken to, though he was most eloquent. In his youth he delighted in music and singing, and was intimate with all the musicians and singers of the day. He was of marvellous capacity and the most tenacious memory; inclined to solitude and fond of study when he had time for it.

DANTON, Georges Jacques, a French advocate by profession, was born at Arcis-sur-Aube, Oct. 26, 1759, and beheaded April 5, 1794. He played a very important part during the first years of the French revolution, of which he was an active and zealous promoter. His external appearance was striking: his stature was colossal; his frame athletic; his features harsh, large, and disagreeable; his voice shook the dome of the chamber of the assembly; his eloquence was vehement; and his imagination was as gigantic as his person, which made every one recoil, and 'at which,' says St. Just, 'Freedom herself trembled.' These qualities contributed to extend his influence, and he became one of the founders of the club of the Cordeliers (which see). After the capture of Louis XVI. at Varennes he took the lead in the meeting of the Champ-de-Mars, which demanded the dethronement of the king. In November he was appointed assistant to the procurator of the commune of Paris. He was foremost in organizing and conducting the attack on the Tuileries (Aug. 10th, 1792), and a few days afterwards was appointed minister of justice by the legislative assembly in recognition of his services on that occasion. He also became a member of the provisional executive council, and usurped the appointment of officers in the army and departments. He thus raised up a great number of creatures entirely devoted to his views. Money flowed from all sides into the hands of the minister, and was as profusely squandered on his tools and partisans. He endeavoured by the terrors of proscription to annihilate all hope of resistance on the part of the Royalists. The invasion of Champagne by the Prussians, Sept. 2, spread consternation through the capital and among the members of the government. The ministers, the most distinguished deputies, and even Robespierre himself, who was at that time in fear of Brissot, now assembled around Danton, who alone preserved his courage. He assumed the administration of the state, and prepared measures of defence; he called on all Frenchmen capable of bearing arms to march against the enemy, and prevented the removal of the assembly beyond the Loire. The close of his celebrated speech has been often quoted:—'Le tocsin qu'on va sonner n'est point un signal d'alarme, c'est la charge sur les ennemis de la patrie. Pour les vaincre, il nous faut de l'audace, encore de l'audace, toujours de l'audace, et la France est sauvée!' From this time forward he was hated by Robespierre, who could never pardon the superiority which Danton had shown on that occasion. Being called on to render an account of the secret expenditures during his ministry, Danton maintained that the ministers should give in their reports collectively; and this view was adopted. He voted for the capital punishment of all returning emigrants, and undertook the defence of religious worship. The contest between the Girondists and the Mountain daily assumed a more serious aspect, and Danton appeared to fear the consequences of these dissensions. The 26th of November, on the occasion of the festival of Reason, in which the adherents of Hébert acted a conspicuous part, he declared himself anew against the attack on the ministers of religion, and subsequently united with Robespierre to bring Hébert and his partisans to the scaffold. But their connection was not of long duration, and the secret hate which had long existed between them soon became public. Danton wished to overthrow the despotism of Robespierre, and the crafty Robespierre endeavoured to undermine him, in order to get rid of a dangerous rival. St. Just denounced him to the Committee of Safety, and Danton was arrested on the night of March 31, together with those who were called his accomplices. Being thrown into prison in the Luxembourg he maintained the appearance of serenity. When he was transferred into the Conciergerie his countenance became dark, and he appeared mortified at having been the dupe of Robespierre. All his discourses were a strange mixture of sorrow and pride. At his trial, on the formal question as to his name and residence being put, he answered, with perfect composure, 'I am Danton, sufficiently known in the revolution; I shall soon pass to nothingness, but my name will live in the Pantheon of history.' April 5 the revolutionary tribunal condemned him to death as an accomplice in a conspiracy for the restoration of monarchy, and confiscated his large property. He mounted the fatal car with courage, and without resistance; his head was elevated; his look commanding and full of pride. Before ascending the scaffold he was for a moment softened. 'O my wife, my dear wife! shall I never see you again?' he exclaimed, but checked himself hastily, and, calling out, 'Danton, no weakness!' ascended the scaffold. Danton was one of the most remarkable characters of the French revolution—a strange mixture of magnanimity, ability, and courage, with cruelty, avarice, and weakness. He was thirty-five years old at the time of his death. Camille Desmoulins and others were executed along with him.

DANTZIG, or DANZIG, a town and port, Prussia, capital of the province of West Prussia, 253 miles N.E. Berlin; on the left bank of the west arm of the Vistula, about 3 miles above its mouth in the Baltic, and at the confluence of the Mottlau and Radaune, which both traverse the town; one of the most important seaports in the Prussian monarchy, as well as one of its chief commercial entrepôts. It is nearly of a circular form, and ranks as a fortress of the first class, being both surrounded by walls and bastions, defended by a citadel and several outworks, and provided with the means of laying a considerable part of the surrounding country under water. It is entered by four gates, has nine suburbs, and is divided into five parts—the Old, New, and Low town, the Speicher [granaries], an island, and Langgarten. The last is the more modern part of the town, and is both regularly and well built. In the other parts the houses are generally old and indifferent, having their gables generally turned towards the streets, which are narrow and winding. The principal edifice is the Dom or cathedral, begun in 1343, but not finished till 1503. It is 360 feet long by 142 feet broad, and its vaulted roof, 98 feet above the pavement, is supported by twenty-six slender brick pillars. It possesses a fine brass font and a curious astronomical clock, which has long ceased to move, but its chief attraction is a painting of the Last Judgment, attributed to John Van Eyck. The other buildings and institutions deserving of notice are the town-house, the church of St. Catherine, the oldest in Dantzig, and the other churches; three monasteries, a nunnery, two synagogues, the exchange, an imposing Gothic edifice built in 1379; the arsenal, gymnasium, navigation school, school of arts, two theatres, foundling and orphan hospitals, also a lunatic asylum, an observatory, and a picture-gallery. It is the seat of the provincial government, and contains the various offices connected therewith; and is also the residence of several foreign consuls. The manufactures are numerous, but none of them are of much importance, excepting tobacco, starch, beer, and brandy, to which must be added the well-known liqueur called Danziger Goldwasser, or Eau de Vie de Dantzig. Some sugar-refining and various manufactures of metal are likewise carried on; also cloth-weaving, the making of potash, and the baking of ship-biscuit. But the prosperity of the town is founded on its trade, which is mostly all transit. The staple article is grain, particularly wheat, for the warehousing of which there are immense granaries on the island of Speicher, capable of containing 500,000 quarters, and secured against fire by a strict prohibition which allows no lights to be used on the island. The wheat, which is chiefly Polish, though small in the grain, is remarkable for the thinness of its skin, and both the quantity and quality of the flour which it yields. There is a considerable trade at Dantzig in amber, which is collected in ditches or pits dug at no great distance from the sea-shore; it is also thrown up on the beach and collected. Large quantities are exported to France, and the trade supports a large number of workmen and their families. The exports by sea in 1872 included 122,909 tons of wheat, 3359 tons of rye, 2924 tons of barley, 1,360,057 railway sleepers, 654,391 oak planks, and a great quantity of other kinds of timber. The number of vessels leaving the port in 1872 was 1873, of a total tonnage of 471,321. The proper port of Dantzig is Neufahrwasser, at the mouth of the Vistula; the sandbanks which encumber the river immediately above seriously obstructing the navigation. Now, however, by means of a canal about 150 feet wide by 15 feet deep, the worst of the obstructions are avoided, and vessels of large size come up close to the town. The history of Dantzig reaches back to the times of historical obscurity. As early as 970 there was a town here. In 1271 it was taken by Mestwin, and in 1294 by the Poles. In the fourteenth century it fell into the hands of the Teutonic knights, under whose sway the town increased, and its commerce was extended. Left by the Teutonic knights, it again, in 1454, fell into the hands of the Poles, who granted it important privileges. After enduring many vicissitudes of fortune, on the second partition of Poland, in 1793, it fell to the lot of Prussia. It was besieged, bombarded, and taken by the French in 1807, and retaken by the Prussians in 1814. Since that time Prussia has done much for the town; but its commerce has never regained its former importance and extent. Pop. (1871), 89,121.

DANUBE [anciently *Danubius;* German, *Donau;* Hungarian, *Duna*], a celebrated river of Europe, originates in two small streams, the Brege and the Brigach, rising on the east declivity of the Schwarzwald, a mountainous region of South-west Germany, in the Grand-duchy of Baden, at an elevation of 2850 feet above sea level, about lat. 48° 3′ N.; lon. 8° 12′ E.; and uniting at Donaueschingen. Its general course is from W. to E., and it falls into the Black Sea by four different outlets, called respectively the Kilia, Stambool, Sulina, and the Edrillis or St. George's Mouths. The Sulina mouth or channel is the deepest. The extent of the basin of the Danube is estimated at 269,189 miles; the direct distance, from source to mouth, upwards of 1000 miles; and its development —of course, including windings—2423 miles. From its source the Danube flows N.E. to Regensburg (Ratisbon), in Bavaria, when it takes a S.E. by S. direction, to Waitzen, in Hungary, previously passing Vienna and Pressburg. At Waitzen it suddenly bends round, and flows nearly due south to the point where it is joined by the Drave, near Esseg, in Slavonia; thence it runs S.S.E. to Belgrade, on the north confines of the Turkish province Servia, of which it subsequently forms the boundary, separating it from the Austrian territory. Continuing its general east course, though not without some marked deviations, it suddenly takes a S.E. course at Orsova, and fairly enters the Turkish European provinces, in which it forms for a long distance the boundary line between Walachia and Bulgaria. At Rassova, on the south-east extremity of the former province, it takes a direction nearly due north to Galatz, when it bends round to the S.E., and after a further course of about 80 miles falls into the Black Sea by the several mouths above enumerated. During its progress from its source in Baden to its embouchure the Danube passes through Würtemberg, Bavaria, the Archduchies of Austria, Hungary, and finally Turkey.

The great basin of the Danube has been divided into four minor basins. The first consists of a vast plateau of a pentagonal form 1640 feet above sea level, 150 miles in length, and 125 miles broad, surrounded by mountains, and comprising a portion of the principality of Hohenzollern, part of the Kingdom of Würtemberg, and the greater part of the Kingdom of Bavaria. This tract is by far the most fertile and most populous through which the Danube passes during its entire career. The principal affluents within this space are the Iser and Lech, both from the right, or south—those from the left, or north, being trifling. During this part of its course the Danube flows through deep and difficult valleys, and is closely hemmed in upon both banks by abrupt and wooded slopes, but expands as it reaches Ulm, about 85 miles from its source, to about 328 feet in width, having an extensive and rich plain on its right bank. After leaving Ulm, where it becomes navigable, it con-

tinues to widen, but has little depth, and is covered with wooded islands—its right bank consisting wholly of extensive plains and marshes.

The second basin belongs to the Empire of Austria, having Vienna nearly in its centre, and comprising the archduchy of Austria, Hungary as far east as Waitzen, and Styria. It is very irregular, and is bounded by very high mountains. Generally, it is well peopled, well cultivated, and the inhabitants industrious. The soil is rich in mineral products, and the climate one of the best in Europe. The principal affluents in this basin are the March or Morawa, and the Ens—the former from the left, and the latter from the right. The Danube here passes through a succession of the most picturesque scenery, till it passes Vienna. Below Pressburg it runs with great velocity, is crowded with islands, and flows between banks alternately covered with reeds, willows, and poplars, and varied occasionally by forest trees and patches of sand. In this portion of its course, also, it sends off numerous arms, inclosing large tracts of country, which thus form islands.

The third basin of the Danube comprises Hungary east of Waitzen, and the principality of Transylvania, and consists of an immense plain, almost without undulations of any kind, and only 394 feet above the sea-level. It is intersected by large rivers with marshy banks, and interspersed with stagnant pools, saline and sandy wastes; rich, however, in mineral products, in flocks and herds, and in wines. It comprises about one-half of the entire basin of the Danube. The climate is bad, especially in the vicinity of the marshes, which cover a space of 3053 square miles. The principal affluents in this basin are the Save, the Drave, and the Morava. From Pesth to Belgrade the river passes through an immense plain covered with sand and alluvium, through which it is constantly forming new channels and sanding up the former ones, sometimes sweeping away towns, and at others leaving such as were built on its banks some miles from them. Below Belgrade the river wends its way, now between slight undulations, and now through a cultivated plain; at one time separating into two or more branches, at another forming only one vast stream. Below Moldava it passes for 60 miles through a succession of rapids and shallows, interspersed with rocks and sand-banks, where it has cut a passage for itself through the cross chain of hills which connect the Carpathian Mountains with the Alps; and between Drenkova in Hungary, and Scala Kladova in Servia, the navigation is partially interrupted by three great rapids, the principal or last and lowest of which is the famous cataract called the Iron Gate, where the stream rushes through a narrow channel between stupendous rocks with great rapidity, ending with a series of whirlpools, eddies, and smaller falls. Some of the obstructions to navigation have been removed by blasting, so that vessels drawing 9 feet of water can pass at certain seasons; but the craft employed draw seldom more than 4 feet.

The fourth basin comprises Roumania, a portion of Bessarabia, and Bulgaria. This tract is flat, inundated, and marshy along the banks of the river; dry, mountainous, and difficult on the borders of the basin. It is fertile in products of every kind, yet badly cultivated; thinly peopled, with miserable roads and wretched villages. The principal affluents in this basin are the Aluta, Sereth, and Pruth. In its progress through Turkey the Danube gradually increases in width from 1400 to 2100 yards; and latterly it forms an expanse of water like a sea, and is studded with islands. Excepting between Drenkova and Kladova, the Danube may be said to be navigable for steam-vessels from Ulm to the sea, although in some places rendered difficult by the occurrence of shallows and sand-banks, intersected by narrow and intricate channels. The outlets of the Danube are separated from each other by several low islands covered with reeds and trees. The greater part of the ships bound up the river enter it by the Sulina mouth, it being the deepest. The Danube receives sixty navigable tributaries, and its volume of water is nearly equal to that of all the rivers that empty themselves into the Black Sea taken together. Its rapidity is in many places above Orsova so great as to render any navigation except that of steam impossible, but below that point its current is gentle and equable. A number of steam-vessels now ply on the river between its principal towns. The principal towns on the banks of the Danube are Ulm, in Würtemburg; Regensberg (Ratisbon) and Passau, in Bavaria; Linz and Vienna, in Austria; Pressburg, Buda, Peterwardein, and Orsova, in Hungary; Belgrade, Widin, Nikopol or Nicopolis, Rustchuck, Silistria, Hirsova, and Brahilou, in Turkey.

DANUBIAN PRINCIPALITIES. See MOLDAVIA, WALACHIA, and ROUMANIA.

DAOUDNAGUR, a town, Hindustan, presidency Bengal, province Bahar, right bank Sone. It is a miserable-looking place, and contains a cloth-factory. It was built by Daoud Khan, the last king of Bengal, about the middle of the sixteenth century. Pop. estimated at 10,000.

DAOURIA, a country, Asia, now included partly in the Chinese territory of Manchooria and the Russian government of Irkutsk. It is traversed from north-east to south-west by ridges of mountains, offsets of the Yablonoi Krebit, and forming the Daourian Mountains. They lie east of Lake Baikal, and are rich in silver, zinc, copper, and mercury. The country is traversed by the Shilka, one of the head streams of the Amoor.

DAPHNE, the Greek name for *laurel*, is applied in mythology to a daughter of the river god Peneus, beloved by Apollo, by whose contrivance her lover Leucippus was slain. The nymph, deaf to the suit of the god, and fleeing from him, besought the earth to swallow her up. According to some she besought her father or Zeus to protect her. Her prayer was heard, for at the moment when Apollo was about to encircle her in his arms, her flight was suddenly arrested, her feet took root in the earth, her arms became branches, and, instead of the nymph, Apollo embraced a laurel, which was thenceforth consecrated to him.—Daphne was also the name of a daughter of Tiresias. She was priestess in the Temple of Delphi.—Also a grove near Antioch, planted by Seleucus Nicator, who also erected a temple there, and dedicated it to Apollo and Diana, which was a place of pagan pilgrimage until the spread of Christianity caused its abandonment.

DAPHNE, a genus of plants of the natural order Thymelaceæ. They are shrubs, inhabiting the greater part of the northern hemisphere, but chiefly the south of Europe and the warmer parts of Asia. The best known is the mezereon (*D. Mezereum*, Linn.) It has pale-green ovate-lanceolate leaves, expanding after the flowers, which are of a violet-red colour and very fragrant. The berries are red. The bark is used in cutaneous diseases. *D. laureola* (spurge laurel) has an irritant bark, and its berries are poisonous. Paper and rope are made from the bark of some species. The plants of this order generally possess acrid, irritant, and occasionally narcotic qualities.

DAPHNIN, the bitter principle of *Daphne alpina*, and other species of Daphne, obtained in the form of small, transparent, rectangular prisms. They are

hard, of a grayish colour, a bitter taste; when heated evaporate in acrid acid vapours, and yield a crystalline sublimate of *umbelliferone*, and are sparingly soluble in cold, readily so in boiling water, and still more freely in boiling alcohol, but insoluble in ether. It was originally supposed to be an alkaloid, but it is now recognized as a glucoside. When boiled with dilute sulphuric acid it decomposes into sugar and *daphnetin*. The latter body forms fine monoclinic prisms, which sublime below 480° Fahr. It has a harsh taste; it dissolves readily in boiling water and in boiling alcohol. The bark and the ethereal extract of the bark of *Daphne Mezereum* are used in medicine both internally and externally. From the residue of the extract daphnin can be conveniently prepared.

DAPHNIS, in fabulous history, the son of Hermes (Mercury) by a nymph, educated among the nymphs, and celebrated in the Sicilian traditions as the author of bucolic poetry, and also as a performer on the shepherd's pipe. He pastured his flocks upon Mount Ætna. The nymph Echenais, who loved the youth, threatened him with blindness if he should love another; but being intoxicated with wine by the daughter of a Sicilian prince, he forgot her warnings, and thus brought upon himself the threatened punishment. Some say that he died of grief; others that the nymph transformed him into a stone. All the nymphs bewailed his death, and Hermes raised him to the heavens. On the spot where he died flowed a fountain, at which the Sicilians afterwards performed yearly sacrifices.

DARAB, or DARABJERD, a town, Persia, province of Farsistan, beautifully situated in an extensive plain among groves of dates, oranges, and lemons, 140 miles south-east of Shiraz; pop. from 15,000 to 20,000. It was once a place of much greater extent and importance, as indicated by its ruins, among which are several remarkable remains. Its chief trade is in lemon-juice, exported to all parts of Persia. The tobacco cultivated in the neighbourhood is highly esteemed for its mild fragrance, and forms an important article of commerce. About 4 miles to the south of the town are some interesting excavations and sculptured rocks.

D'ARBLAY, MADAME. See BURNEY.

DARCET, FELIX, son of Jean Pierre Darcet, was born at Paris about 1807, studied medicine and became a physician, but paid some attention to chemistry, and published researches on the preparation of hydriodic acid, on the action of iron at a high temperature on benzoic acid and on camphor, on succinic acid, on arsenovinic acid, on chloretheral. He made two journeys to Egypt, and was on the point of going to Brazil, to carry out a scientific expedition, for which he had got instructions from the French Academy, when he was burned in his bed, and died at Paris, Dec. 18, 1846.

DARCET, JEAN, an eminent French physician and chemist, born Sept. 7, 1725, at Douazit, in Guienne. He preferred the study of medicine to that of the law; in consequence of which, having been discarded by his father, he was obliged to teach Latin for his support while pursuing his studies at Bordeaux. He accompanied the celebrated Montesquieu to Paris in 1742, and remained with him till his death as a literary assistant. He afterwards devoted himself to chemistry, especially to technical chemistry, was appointed professor of chemistry in the College of France, and regent of the Medical Faculty. Darcet made many experiments with a view to the improvement of the manufacture of porcelain. He also tried the effect of fire on the various kinds of earths, and demonstrated the volatility of the diamond. In 1776 he published a memoir on the geology of the Pyrenees, over which he had travelled in 1774. He succeeded Macquer as a member of the Academy of Sciences and director of the manufactory of Sevres. He was afterwards appointed inspector-general of the assay of coin and inspector of the Gobelin manufactory. He made several important chemical discoveries, and contributed much to the present improved state of the science. A fusible alloy of lead, bismuth, and tin is named after him. He died at Paris Feb. 13, 1801, at which period he was a member of the Institute and of the Conservative senate.

DARCET, JEAN PIERRE JOSEPH, an excellent practical chemist, son of the preceding, was born at Paris Aug. 31, 1777. His mother was a daughter of the chemist Rouelle. He began his chemical studies early with his father and with Vauquelin. In his twenty-fourth year he was made assayer of the mint, and from that time devoted himself chiefly to chemistry in its application to the arts. A long list of his discoveries and of the improvements introduced by him in this branch of science might be given. Being employed by the government in the manufacture of gunpowder, he rendered its preparation much more easy by new processes. He greatly assisted in extending the manufacture of soda artificially, succeeded in producing alum equal in quality to that of Italy, brought the art of stereotyping to greater perfection, facilitated the preparation of sulphuric acid, investigated the best alloys for cannon, for cymbals and tam-tams, and for statues, &c. Among his other discoveries we may notice the extraction of soda from chestnuts, the preparation of sugar from the same material, and the extraction of jelly from bones by means of an acid. The hospital St. Louis at Paris is indebted to him for the excellent footing on which he put its baths, chimneys, and illumination by gas, and for the process which he introduced for bleaching the linen of the hospitals. He also made another discovery of great importance, whereby he obtained the prize of 3000 francs which Ravrio had provided for the discovery of the means of protection against the fine dust of quicksilver, which had been so unhealthy to the gilders. Darcet's discovery completely attained the object, and this branch of French industry has since that time greatly increased in importance. He also offered a plan for preserving the health of those concerned in the manufacture of Prussian blue. He died at Paris Aug. 2, 1844.

DARDANELLES (ancient *Hellespont*), a narrow channel, Turkish dominions, which connects the sea of Marmara with the Grecian Archipelago, and at this particular point separates Europe from Asia. Its junction with the Archipelago is in about lat. 40° N., and with the Sea of Marmara lat. 41° 25' N. It stretches north-east and south-west, and is about 40 miles in length, varying in breadth from 1 to 4 miles. There is always a rapid current in the channel running south, the volume and velocity of which is much increased by the prevailing winds, which blow in the same direction with the stream for at least ten months in the year. There are shoals in some places, but deep water is always to be found in some part of the channel. The Asiatic side presents the most beautiful scenery, and is seen in proceeding up the strait, gradually rising from the sea upwards to the range of Mount Ida, and exhibiting the appearance of a fine and fertile country. The European side is in general steep and rugged, but in many parts densely peopled and highly cultivated; while its various inlets form secure harbours for vessels of every size, and well sheltered from north gales, to which, as already noticed, these parts are subject. On both shores there are numerous forts and batteries, for the

purpose of preventing any vessel in case of war from passing through the channel. Of these there are eight upon the European side, mounting in all 340 guns, some of which are calculated to throw stone shot of enormous size; and on the Asiatic side seven, mounting 383 guns, thirty-four of which throw stone shot. These guns, as well as some of the others, having no carriages, cannot be pointed, and can fire with effect only when a ship covers them. The guns for discharging stone shot require a charge of 320 lbs. of powder. The modern name of this strait is derived from the castles, called the Dardanelles, built on its banks, at its south-west entrance; its ancient name, Hellespont, from Helle, daughter of Athamas, king of Thebes, who was drowned in it. It is also memorable as the scene of the death of Leander, who used to swim across from Abydos on the Asiatic side, at the narrowest part of the strait, but yet about a mile in breadth, to visit Hero of Sestos on the European side; a feat also performed by Lord Byron, who achieved it in one hour and ten minutes. Nearest the Archipelago lie the two castles called the *new castles*, because they were built subsequently to the two others, called the *old castles*, in the middle of the seventeenth century, under Mohammed IV., to afford protection to the Turkish fleet against the Venetians. The distance of one from the other is about 2¼ miles. About 18 miles farther to the north-east lie the old castles, built by Mohammed II. immediately after the conquest of Constantinople, which are not more than about 1800 yards apart. The Turks, confiding in the celebrity of the castles of the Dardanelles, have taken so little care to keep them in a state of defence, that in 1770 they were completely in ruins, and upon the Asiatic side there was but a single battery standing, and that half-filled with rubbish. On the 20th of July of that year, when the squadron of the Russian Admiral Elphinstone, consisting of three ships of the line and four frigates, in pursuit of two Turkish ships of the line, appeared before the first castles, the Turkish batteries, from want of ammunition, were obliged to cease firing after one discharge, and Elphinstone sailed by without receiving more than a single shot. Warned by this unexpected circumstance, the Porte accepted the offer of Baron de Tott (see TOTT) to restore the castles to their former condition, and he rendered them in a short time impregnable. But the Turks were too indolent to preserve them long in this condition; for in 1798, Eton, an Englishman, who was for a considerable time resident in Turkey, in a description of this empire declared that at that time a fleet might easily pass the Dardanelles. The accuracy of this statement was confirmed by Admiral Duckworth's experience, who, on the 19th of February, 1807, with eight ships of the line and four frigates, together with fire-ships and gun-boats, effected a passage through the Dardanelles without loss, and appeared on the next day before Constantinople, which till then had never seen an enemy's fleet. In 1854, when Britain and France united to defend Turkey against the unprincipled aggressions of Russia, the castles of the Dardanelles, and the other defences connected with Constantinople, were put in a state of complete repair.

DARDANUS, in mythology, the progenitor of the Trojans, and so of the Romans, and the son of Zeus and Electra, the daughter of Atlas, emigrated from Samothrace (according to others, from Arcadia, Crete, &c.), and settled in Phrygia, in the country which was afterwards called Troas. Here he built a city, which, from him, was called Dardanum, or Dardanus, and introduced the worship of Athena (Minerva).

DARFUR, or DARFOOR (*country of Foor*), a considerable kingdom of Central Africa, occupying a large portion of the wide interval between Abyssinia and Bornou, the most eastern part of Nigritia. It is difficult to fix its limits, which, however, according to the most authentic account, may be considered as lying between lat. 11° and 15° N., and lon. 26° and 29° E. On the east it has Kordofan and the country of the Shilluks, which separate it from Sennaar and Abyssinia; on the west, Bergoo, which divides it from Baghirmi and Bornou; while the regions to the south are occupied by barbarous nations. With respect to its climate, productions, the animals it contains, and also the manners of its inhabitants, and its government, it nearly resembles other countries in Africa. The people are semi-barbarous; their government is a despotism, and their occupation chiefly agriculture. The mechanical arts are at a low ebb, and their houses are rudely constructed of clay, with a coating of plaster, or are mere reed huts of circular form, and with scanty accommodation. Its commerce is extensive. The grand intercourse is with Egypt, and is carried on entirely by the African system of caravans. There is no regular caravan, as between Fezzan and Cairo. The motions of that from Fur are extremely uncertain, and two or even three years sometimes elapse without one. The caravan going to Egypt consists often of 2000 camels and 1000 men. Among the exports, the most important are slaves, taken in the negro countries to the south; camels, ivory, the horns, teeth, and hide of the rhinoceros and hippopotamus, ostrich feathers, gum, pimento, parroquets in abundance, and a small quantity of white copper. The imports are extremely various, comprising beads of all sorts, toys, glass, arms, light cloths of different kinds, chiefly made in Egypt, with some of French manufacture, red Barbary caps, small carpets, silks, shoes, and a considerable quantity of writing paper. They are Mohammedans; but, in spite of the Prophet, much given to intoxicate themselves with a certain beverage called *merissah*. Circumcision is practised upon both sexes and by all classes. Unlimited polygamy is allowed, and the intercourse between the sexes is of the most indiscriminate character. The army is composed of irregular troops, armed with shield and spear, or occasionally bow and arrows. Pop. estimated at from 1,000,000 to 3,000,000, or even 4,000,000.

DARIA, or DERIA, signifies *river* in the Tartar languages; as, Kizil-daria, *red-river*.

DARIEN, GULF OF, a gulf of the Caribbean Sea at the north extremity of South America, between the Isthmus of Panamá and the mainland. Several rivers flow into it, the largest of which is the Atrato. The coast is full of sharp and inaccessible shoals, and only towards the west and south are there fit places for disembarking.

DARIEN, ISTHMUS OF, often used as synonymous with the Isthmus of Panamá (which see), but more strictly applied to the neck of land between the Gulf of Darien and the Pacific.

DARIEN SCHEME, a celebrated financial project, conceived and set afloat by William Paterson, a Scotsman, towards the close of the seventeenth century. It is said that he was originally a buccaneer, that he was a clergyman, and that he was a merchant; the probabilities are on the side of the last assertion, as he possessed a wide knowledge of commerce and finance. He was undoubtedly a man of an original mind, and of a bold and enterprising disposition. He was the first projector of the Bank of England, and being defrauded of his just recompense by those who adopted his plans, he resolved to confine his future schemes to the benefit of his native country. On his original and ostensible design of establishing an East India trade in Scotland, he in-

grafted the secret and magnificent plan of forming an emporium on each side of the Isthmus of Darien or Panamá, for the trade of the opposite continents. According to his idea, the manufactures of Europe were to be sent to the Gulf of Darien, and thence conveyed by land across the ridge of mountains that intersect the isthmus, where they were to be exchanged for the produce of South America and of Asia; and thus, to use his own emphatic language, he would wrest the keys of the world from Spain. In order to attract encouragement and support, he proposed to render his settlement a free port, and to banish all distinction of party, religion, or nation. But Scotland was at this time very poor; and Paterson went to London to procure subscriptions, which soon ran up to the amount of £300,000. But alarm, first excited by the East India Company and the West India merchants, soon spread over the whole English nation. Even the Parliament addressed King William, in an address remarkable for narrow and illiberal views; and the king, who could ill afford to quarrel with both the English Houses of Parliament, nor compromise himself at this juncture with Spain, replied to the address in terms which were interpreted as disfavourable to the scheme, and the English subscriptions were withdrawn. But Paterson himself was not to be easily intimidated; and Scotland, indignant at the opposition which the plan had met with in England, avowedly because it would be beneficial to the Scotch, immediately subscribed £400,000, although at that time there was not above £800,000 of cash in the kingdom. Only a little more than the half of the subscriptions, however, was ever paid up. Such was the national enthusiasm, that young women threw their little fortunes into the stock, and widows sold their jointures to get the command of money for the same purpose. Besides this sum, £300,000 was subscribed at Hamburg, which, however, was withdrawn, in consequence of the threatening memorial presented by the English resident to the senate of that city. The Scots, nevertheless, persisted in their scheme: five large vessels, laden with merchandise, military stores, and provisions, with a colony of 1200 persons, sailed for the Isthmus of Darien, which they reached after a voyage of about four months.

The settlement was very judiciously formed at Acta, a place at an equal distance between Porto Bello and Carthagena. Here is a secure and capacious harbour, formed by a peninsula, which the colonists fortified and named Fort St. Andrew. To the settlement they gave the name of New Caledonia. Of the 1200 persons who had embarked 300 were gentlemen, unaccustomed to labour, fatigue, or homely fare, and totally unacquainted with any of those arts which are indispensably necessary in a *new* colony. These consequently were of little use; and even the peasants, habituated to a cold climate, were unequal to the fatigue of clearing the ground under a burning tropical sun. In addition to these untoward circumstances, their provisions were either improper for the climate or soon exhausted. The cargoes of merchandise which they sent to the West India Islands were not properly adapted for that market. The infant colony was attacked by the Spaniards, and proclamations were issued at Jamaica, Barbadoes, and in the American plantations, prohibiting all succour or access to the Scots at Darien, on the pretence that their settlement there was an infringement of the alliance between England and Spain. For eight months the colony bore up against these accumulated misfortunes and persecutions; but at the end of this period those who survived were compelled, by disease and famine, to abandon their settlement and return to Europe.

Before this circumstance was known two other expeditions sailed from Scotland; and the information of the abandonment of the first colony only served to rouse the Scottish nation to more determined perseverance in the plan. When the second expedition arrived, they found the huts burned and the forts demolished; famine and disease assailed them; they were attacked by the Spaniards from Panamá, these they repulsed; but a larger force coming from Carthagena obliged them to capitulate, on condition that they should embark with their effects for Europe; few, however, of these, or of the other two colonies, survived to return to Scotland.

The people of Scotland were indignant at this utter and irremediable failure. They endeavoured to extort from William an acknowledgment of the national right to Darien; and failing in this, they presented an address to him to assemble the Scottish Parliament: when it did assemble, a resolution to assert the national right to their colony was only prevented by adjournment, and ultimately by proroguing the Parliament: it was, however, soon necessary to reassemble and mollify it in order to get the supplies for the army; and when it did meet again, some very popular and spirited resolutions were adopted on this subject. The Scottish nation were never afterwards thoroughly reconciled to King William, and even for many years subsequent to his death, the remembrance of the loss of Darien was preserved with resentment and regret. In this scheme many families were reduced to ruin, and few had escaped without the loss of a relative or friend. Paterson, on his passage home, after the ruin of the first colony, was seized with lunacy, from which, however, he recovered. He lived many years after, pitied, respected, and neglected. In order to pave the way for a better understanding between the two countries, the lords commissioners for England agreed in 1706 to purchase the shares of the particular members of the Darien Company. A full account of the Darien expedition is to be found in the second volume of Sir John Dalrymple's Memoirs of Great Britain and Ireland. The best recent authority on the subject is John Hill Burton (History of Scotland since the Revolution of 1688). See also Sir Walter Scott's Tales of a Grandfather for a most interesting but rather one-sided narrative.

DARIUS, the name of several Persian kings, or, according to some writers, the royal title itself. Among the most distinguished individuals of this name are—

1. Darius, the fourth King of Persia, the son of Hystaspes, satrap of Persis. He joined the conspiracy against the False Smerdis, who had possessed himself of the Persian throne. After the conspirators had succeeded in getting rid of the usurper, they agreed to meet early the next morning, on horseback, and to appoint him king whose horse should neigh first after sunrise. The groom of Darius, apprised of this project, led his master's horse in the night with a mare to the appointed place, and, in consequence of this stratagem, the horse of Darius neighed first the next morning. Darius was therefore saluted king, and the nation approved the choice. His reign was marked by many important events. The city of Babylon revolted, partly on account of burdensome impositions of tribute, and partly because the royal residence, under Cyrus, had been transferred from thence to Susa. Darius besieged the city nearly two years without success, and was on the point of abandoning the siege when Zopyrus, one of his generals, by a heroic sacrifice, placed the city in his possession. The mode was this: he mutilated himself in the most shocking manner and fled to the Babylonians, pretending to them that he had suffered this cruel treat-

ment from Darius, and that he wished for vengeance. The Babylonians gave him a command; and after many successful sallies, by which he gained their confidence, they intrusted to him the charge of the whole city, which he immediately surrendered to Darius. After the subjection of Babylon Darius undertook an expedition, with an army of 700,000 men, against the Scythians on the Danube (513 B.C.), who enticed him so far into their inhospitable country by their pretended flight, that he succeeded with difficulty in extricating himself and his army, after suffering great losses. Leaving a part of his forces under the command of Megabyzus in Thrace, to conquer that country and Macedonia, he returned with the remainder to Asia, to recruit at Sardis. He next turned his arms against the Indians, part of whom he subjected (508 B.C.) In the year 501 B.C. a disturbance at Naxos, in which the Persians had taken part, occasioned a revolt of the Ionian cities, which the Athenians endeavoured to promote, but which was suppressed by the capture and punishment of Miletus in 496. To revenge himself upon the Athenians, Darius sent Mardonius with an army, by the way of Thrace and Macedonia, against Greece, and prepared a fleet to make a descent upon its coasts. But his ships were scattered and destroyed by a storm in doubling Mount Athos, and the army was almost entirely cut to pieces by the Thracians. Darius, however, collected another army of 500,000 men, and fitted out a second fleet of 600 ships. Naxos was conquered, and Eretria, in Eubœa, sacked. Thence the army under Datis and Artaphernes proceeded to Attica, and was led by Hippias to the plains of Marathon. The Athenians had in vain besought assistance from their neighbours, and were obliged to depend upon their own resources alone. They marched forth, 10,000 strong, under the command of Miltiades, to meet the Persian army, and animated by the reflection that they were fighting for freedom and their country, obtained a complete victory (B.C. 490). Darius now determined to take the command of a new army in person, but was prevented by domestic troubles, and died B.C. 485. This prince did much to improve the internal administration of his kingdom. In the year 508 B.C. he sent his admiral Scylax to explore the river Indus, and he encouraged commerce and arts by useful institutions and laws. His successor was Xerxes.

2. Darius II., surnamed *Nothos*, or the Bastard, by the Greeks, an illegitimate son of Artaxerxes I. (*Longimanus*). He ascended the throne in 423, and died in 404. He suppressed several rebellions of his satraps; but Amyrtæus succeeded in maintaining himself in independent possession of Egypt, which had revolted in 414. His son Cyrus is familiar to us through Xenophon's Anabasis.

3. Darius III., surnamed *Codomannus*, son of Arsanes and Sysigambis, and great-grandson of Darius II., was the twelfth and last king of Persia. He ascended the throne B.C. 336, when the kingdom had been weakened by luxury and the tyrany of the satraps under his predecessors, and could not resist the attacks of a powerful invader. Such was Alexander of Macedon; and the army which was sent against him by Darius was totally routed on the banks of the Granicus, in Asia Minor. Darius then advanced, with 400,000 soldiers, to the plains of Mesopotamia. The Grecian mercenaries advised him to await the enemy here, as the level country would enable him to draw out his forces to advantage; but Darius hastened forward to meet Alexander in the mountainous Cilicia. Curtius describes the splendour of his march. Darius was a second time totally routed, near the Issus, B.C. 333. He himself escaped, under cover of the night, to the mountains. His mother, his wife, and three of his children fell into the hands of the conqueror, who treated them with great generosity. Alexander loaded 7000 camels with the spoil taken here and at Damascus. Darius was so far from being discouraged by these defeats that he wrote a haughty letter to Alexander, in which he offered him a ransom for the prisoners, and invited him to a new engagement, or, if he did not choose that, granted him permission to retire into Macedonia. Alexander then laid siege to Tyre, on which Darius wrote him another letter, offering him not only the title of *king*, which he had before refused to do, but also 10,000 talents ransom, and all the countries of Asia as far as the Euphrates, together with his daughter Statira in marriage. These propositions, however, were unavailing. Alexander subjected Egypt, and Darius found himself once more obliged to collect an army, which most writers estimate at 1,000,000. He led his forces from Babylon to Nineveh, while Alexander was encamped on the banks of the Tigris. The two armies met between Arbela and Gaugamela, and after a bloody engagement Darius was compelled to seek safety in flight (331 B.C.) Alexander took possession of his capital, Susa, captured Persepolis, and reduced all Persia. Darius meanwhile arrived at Ecbatana, in Media, where he had another army of 30,000 men, among whom were 4000 Greeks, who remained true to the end, besides 4000 slingers and 3000 horse, commanded by Bessus, the governor of Bactria. With these he wished to march against the conqueror, but a conspiracy of Nabazanes and Bessûs frustrated his plan. The magnanimous prince would not credit the report of the conspiracy which reached his ears, and at the same time observed that his death could not be premature if his subjects considered him unworthy of life. The traitors soon after took possession of his person, and carried him in chains to Bactria. Here he refused to accompany them any farther, and they transfixed him with their javelins, and left him to his fate. A Macedonian, named Polystratus, saw the chariot of Darius, and as he was drinking at a neighbouring fountain heard the groans of a dying person. He approached the chariot, and found the king in the agonies of death. Darius begged for some water, on receiving which he requested Polystratus to thank Alexander, in his name, for the generosity with which he had treated the captive princesses. Scarcely had Darius expired, when Alexander came up. He melted into tears at the sight of the corpse, caused it to be embalmed, and sent it to Sysigambis that it might be deposited by the side of the other Persian monarchs. Darius died (330 B.C.) in the fiftieth year of his age, with the reputation of a humane, peaceful, and just sovereign.

DARJEELING, or Darjiling, a British sanatory station for her majesty's troops in India, in the Sikkim territory, about 318 miles N. Calcutta, and though little more than 36 miles from the plains of Bengal, at an elevation of 7400 feet above sea level. 'From the station the view in every direction overlooks mountain-ranges covered with dense forests, except in a few spots where partial clearances have been made for cultivation. No bare grassy mountains meet the eye, no rocks or precipices afford any relief from the prevailing uniformity, which, but for the magnificence of the snowy mountains behind, would be undoubtedly monotonous and fatiguing' (Dr. Thomson). The atmosphere is humid and moist, and the annual fall of rain 120 inches.

DARLASTON, a town and parish, England, county and 17 miles S. by E. of Stafford. It is an irregular, straggling place, but is rapidly increasing, deriving its prosperity from the extensive coal and iron mines in the vicinity, and the manufacture of iron into

various articles, as gun-locks, bolts, bars, screws, &c. Pop. 14,416.

DARLING, GRACE, a celebrated English heroine, was born in November, 1815, in the Longstone lighthouse, of which her father was keeper. The event which made her famous occurred on the 6th Sept. 1838, when she was about twenty-three years of age. The *Forfarshire*, a steamer of about 300 tons, with a crew of twenty men, the master and his wife, and forty-one passengers, sixty-three persons in all on board, was on her way from Hull to Dundee. She started a leak when off Flamborough Head, which increased so rapidly that at five o'clock on the evening of the 5th, when passing between the Farne Islands and the mainland, the engine-fires were drowned out. Wind, rain, fog, and a heavy sea all beset the unfortunate vessel at once. About 4 o'clock on the 6th she struck on a precipitous part of one of the rocky islands; a second wave lifted her up, and she was broken in two by falling on a sharp ledge. The fore-part of the vessel remained upon the rock, the hinder part was carried off by a rapid current through a channel called the Pifagut. Some of the crew and a passenger had left in a boat when the ship first struck. The remainder of the crew and passengers had to stay on the rock until the arrival of daylight. At daybreak William Darling descried them from Longstone, about a mile distant, but accustomed to scenes of danger as he was, he shrank from attempting to reach the wreck through a boiling sea in a boat. His daughter, however, who could see, by the aid of a glass, the sufferers clinging to the wreck, implored him to let her accompany him in the endeavour to relieve them. At last he consented; the mother helped to launch the boat, and the father and daughter each took an oar. They reached the wreck and found nine sufferers, whom they succeeded in bringing to the lighthouse. The news of the heroic deed soon spread. The pretty name, Grace Darling, was in everybody's mouth, and the brave girl received testimonials from all quarters. A purse of £700 was publicly subscribed and presented to her; she was invited to dine with the Duke of Northumberland, and received from the duchess a gold watch. She was offered a large sum by the manager of a London theatre just to exhibit herself seated in a boat on the stage for a few minutes, but the gentle and modest girl instantly rejected such a proposal. She died of consumption 20th October, 1842, at the early age of twenty-seven.

DARLINGTON, a municipal and parliamentary borough, England, in the county and 17½ miles south of Durham, beautifully situated on a height sloping towards the Skerne, which is here crossed by a bridge of three arches. It is well built, chiefly of brick, and nearly in the form of a square, and has among its public buildings an ancient Gothic church with a lofty spire, founded in 1160, restored in 1865; corporation buildings, with a handsome clock-tower; an elegant market-house, post-office, &c. There are a flourishing mechanics' institute and library, and many well-conducted academies and schools. The woollen manufacture is carried on to a considerable extent, and there are large iron-works, and works manufacturing steel, locomotive engines, iron-bridges, &c. The town is intersected from north to south by the North Eastern main line, and from east to west by the Stockton and Darlington Railway. The latter is the first line in England on which locomotive steam-engines were used. The town was incorporated in 1867. Pop. 27,729.

DARMSTADT, or HESSE-DARMSTADT. See HESSE.

DARMSTADT, a town, Germany, capital of the grand-duchy of Hesse-Darmstadt, in a sandy plain, on the Darmbach, 15 miles S. Frankfort. It is surrounded by walls and ditches, and consists of an old and a new town. The former, which is the business part of the town, is very poorly built; the houses are old, and the streets narrow and gloomy. The new town has a much more agreeable appearance, and is laid out with great regularity. Two principal streets, the Rheinstrasse and the Neckarstrasse, traverse it from east to west, and north to south, respectively, and are lined by houses of handsome appearance. Immediately off the Rheinstrasse is the finest public square, the Louisenplatz. In its centre is a Doric column, about 150 feet high, surmounted by a statue of Duke Louis I.; and around it are a number of lofty and elegant mansions, among others the new palace, the residence of the grand-duke, built at the commencement of the present century. Other buildings deserving of notice are the old palace, a large pile of mixed architecture, now fitted up as a residence for the hereditary grand-duke, containing a picture-gallery, with some fine paintings; a museum of natural history, particularly rich in the remarkable fossils which have been dug up in the neighbourhood of the Rhine, and a library of 450,000 volumes; the theatre, the estates' house, with a fine hall, in the form of a semicircle; the government offices, the Roman Catholic church, built by Moller, externally of brick, and internally in the form of a rotunda, surrounded by pillars 50 feet high; the Protestant church, a somewhat unsightly building; the drill-house, originally intended for drilling the garrison under cover in wet weather, but now used as an arsenal, and remarkable for the large size and ingenious construction of its roof: the prison, the infantry barracks, and the military lazaret. Besides the Louisenplatz above referred to, there are several other squares, among which is the market-place, an irregularly-shaped area, surrounded by old houses, of which the town-hall [*Rathhaus*], built in 1580, is the most gloomy looking. Darmstadt depends more upon the residence of the court than upon either trade or manufactures. Of the latter, however, may be mentioned carpets, playing cards, carriages, matches, tobacco, philosophical instruments, and machinery. A. C. Schleiermacher, and Liebig, the celebrated chemist, were born here. Pop., including Bessangen, 39,584.

DARNEL (*Lolium temulentum*), known in Scotland by the name of *doits*, a pernicious weed, which used to be found in abundance in wheat or rye fields, from which improved husbandry has now almost banished it in Britain. It belongs to the grasses, and is allied to the rye-grass. It is an annual, of robust growth, having a stout erect stem of about 3 feet long, well furnished with bearded seeds similar in appearance to light or inferior wheat. These seeds, until recently, were commonly supposed to be poisonous, producing stupefaction, vomiting, violent purging, and death. Linnæus states, that when mixed with malt they impart to ale their stupefying and intoxicating properties; but when mixed with bread they are comparatively harmless, unless when eaten hot. It is now believed, however, that the injurious effects attributed to this weed are partly caused by the inferior wheat, among which, especially in poor harvests, it gets mixed. Flour in which darnel is present may be detected by digesting in alcohol, which then assumes a characteristic green tint.

DARNETAL, a town, France, in the department of Seine-Inférieure, on the Robec and Aubette, 2½ miles east of Rouen. The town is charmingly situated at the top of a narrow valley, is well built, and has two principal churches, one called the Longpaon, a large Gothic edifice, and the other a parish church of modern construction, with exception of a square

Gothic tower, of great antiquity. There are several extensive woollen factories and spinning mills. Pop. 5909.

DARNLEY, Henry Stuart, Lord, husband of the Scottish queen, Mary Stuart, was born in 1546. His father, the Earl of Lennox, was descended from a branch of the house of Stuart; his mother, Margaret Douglas, was still more directly of royal lineage, being the daughter of Margaret of England, who was sister of Henry VIII., and, by her first marriage, queen of James IV. The Earl of Lennox, during a long exile, into which he had been driven by the ascendency of the Hamilton family, had become a naturalized subject of Queen Elizabeth, and his son Henry, having been born in England, was her subject by a still stronger title. It may have been partly on this account that Mary selected him for her husband, as she had been told that such a marriage would remove one obstacle to her own succession to the English crown, or at least to the succession of any of the children who might be born of it, since they would have an English-born subject for their father. It is more probable, however, that in this matter Mary was far less guided by policy than by inclination. Darnley, though devoid of real merit, had, by his personal attractions, won her heart, and she became so completely enamoured, that though her intended nuptials were announced, and were afterwards celebrated with much splendour, she was too impatient to wait, and anticipated them by a private marriage in David Rizzio's chamber (July, 1565). It was an unfortunate match; and ere long gave rise first to coolness, then to open quarrel, and finally to deadly hate. There were, undoubtedly, faults on both sides. Darnley thought, or affected to think, that her favouritism for David Rizzio was of a kind which no husband ought to tolerate, and leagued with a body of conspirators, who, on the evening of the 9th March, 1566, entered the queen's chamber in Holyrood Palace, dragged Rizzio from her side, and murdered him in an adjoining room, under circumstances of horrid barbarity. This deed was not likely to reawaken the old passion, but calculated to arouse one of an opposite character. She affected, however, to be reconciled to him, but could not long conceal her contempt for the handsome imbecile. About the end of that year Darnley, who had been on a visit to his father, the Earl of Lennox, at Glasgow, was seized with smallpox. In January Mary proceeded thither, and had him conveyed to an isolated house called Kirk of Field, which stood at some distance from Holyrood. This dwelling, which belonged to a retainer of Bothwell's, the rapidly rising favourite, was blown into the air with gunpowder (10th February, 1567). The dead bodies of the king and his page were found in a field at a distance of 80 yards from the house, quite free from any mark which such an explosion would cause. The likelihood is that they were strangled on their attempt to escape. Bothwell, who was universally declared the murderer, was subjected to a mock trial, and acquitted. Previous to this tragedy a son had been born of the marriage, who afterwards united the Scotch and English crowns under the name and title of James I. of England and VI. of Scotland.

DARTERS (*Plotus*), a genus of long-necked, straight-billed swimming birds, found in the southern states of North America, in Africa, Asia, and Australia. In appearance and habits the darter resembles the cormorant, especially in the structure of the feet, wings, and tail; the bill and neck are like those of the heron. The general colour of the body is dark glossy green; of the wings and tail, bluish black. Their haunts are in low swampy localities, by the side of murky streams. They generally perch on trees whose branches dip into the water. They are the best freshwater divers known, and they drop into the water with such surprising skill, that the large body makes scarcely any noise, and but little ripple on entering the water. When swimming, its body is submerged, and the only part visible is the long neck writhing about like an aquatic serpent, a peculiarity which has gained for it the name of snake-bird. Its food is small fish, shrimps, young reptiles, leeches, &c. The quantity of fish it can consume is enormous, but like other fish and flesh eating birds, it can remain several days without food with impunity.

DARTFORD, a market-town, England, Kent, pleasantly situated in a narrow valley, on the Darent, on the North Kent Railway, 15 miles south-east of London. It has a large and ancient church with an embattled tower. On the river are numerous paper, corn, and oil mills, a large foundry, and an extensive gunpowder manufactory. There are also calico and silk printing works in the neighbourhood. Dartford was the first place in Britain where a paper-mill was erected, and it was here also that the first mill in England for rolling and slitting iron was established. Edward III. founded a convent here, some remains of which still exist. The celebrated Wat Tyler was a native of this place, and the insurrection known by his name broke out at Dartford. Pop. 8298.

DARTMOOR, an extensive, rugged, mountainous tract in England, in the western part of Devonshire, often called the *Forest of Dartmoor*, but at present having no appearance of a forest, except what is afforded by an assemblage of dwarf oaks, intermixed with ash and willow; reaching from Brent s., to Oakhampton n., 22 miles, with a breadth of about 20 miles, and occupying from 130,000 to 150,000 acres. In the centre of the moor there is an extensive swamp in which the rivers Dart, Teign, Taw, Yealm, Erme, and a great number of smaller streams have their source. Cattle and sheep are fed on the coarse grass during the summer months. In the winter the storms from the Atlantic sweep over it, and it would be difficult to imagine a more desolate-looking place. Several of the rugged granite hills (here called *tors*) are of considerable height, Yes Tor rising 2050 feet above the plain. The district is noted as being the site of a prison built in 1809 for the custody of the French prisoners of war at a cost of £127,000. At one time it contained 10,000 inmates. It covers an area of 30 acres, and is now fitted up for the reception of convicts. Experiments made in cultivating the moor by convict labour have turned out successfully, a large track surrounding the prison being now under crop. Dartmoor offers considerable attraction to the tourist and naturalist. Druidical and other aboriginal remains may be traced. Since 1337 the tract has been annexed to the duchy of Cornwall.

DARTMOUTH, a seaport town of England, county of Devon, situated near the confluence of the river Dart with the British Channel, 30 miles south from Exeter. The streets rise one over the other on the face of the steep rock on which the town is built, and are connected with each other by flights of steps. There are three parish churches, and places of worship for various Dissenting bodies. The principal exports: woollen goods, cider, and barley; imports: wine, oil, salt, and fruit. It has a good harbour, with deep water. The inhabitants are engaged in the coasting-trade, the manufacture of paper and cordage, and in ship-building. The entrance to the harbour is defended by a castle. Pop. 5366.

DARU, Pierre Antoine Noel Matthieu Bruno, Count, one of the ablest French statesmen of the school of the revolution and Napoleon, was born in the year 1767, at Montpellier. He commenced his military career in his sixteenth year, after having

received an excellent education. At the breaking out of the revolution he adopted its principles, like other young men of talent. He never relinquished his poetical and literary pursuits, even in the camp, amidst the most uncongenial labours. His reputation as a poet was established by his masterly translation of Horace. The first edition appeared in 1800. About the same time appeared his Cléopédie, or Theory of Literary Reputation, a poem full of elegance and animation. The penetrating eye of Napoleon soon distinguished him from the multitude, and showed him peculiar favour, while Daru attached himself with unbounded zeal to that extraordinary man. He was intrusted with the most important affairs, and executed these trusts with fidelity to the interests of France and the emperor, by which he drew upon himself the hatred of the opposite party. This is particularly evident in his administration as general intendant, in 1805, 1806, and 1809, in Austria and Prussia. While in the council of state, Daru was considered the most diligent and laborious member of that body except the emperor. There were few important posts in the higher departments of the administration which he did not fill; and the first restoration found him in possession of the portfolio of the department of war. In 1805 he was chosen a member of the National Institute. In 1815 he was elected president of the Academy. In 1818 Daru was called to the Chamber of Peers by Louis XVIII. Not having been called to any other public post after the restoration, he now devoted himself particularly to historical studies; and we are indebted to him for two important works, the Life of Sully and the History of Venice. The last of these is one of the most important productions of modern literature in the department of history. It appeared in 1819, in seven volumes; second edition in 1821, in eight volumes; and the third edition in 1825. As a member of the Chamber of Peers Daru was one of the most zealous defenders of the principles introduced by the revolution. He died near the end of 1829.

DARWAR, a town and fortress, Hindustan, in the Deccan, province Bejapoor, capital of a district of same name; lat. 15° 28′ N.; lon. 75° 8′ E. The town is situated to the south of the fort, and is surrounded by a wall and ditch capable of protecting it against sudden incursions. Pop. 5000.—The fort, although not regularly planned, is naturally strong, and is well guarded by ditches. This place has undergone many vicissitudes, having been taken and retaken many times, both by native princes and by the British.—The district of Darwar lies between lat. 18° and 19° N.; area, 9122 square miles. The soil and climate are well adapted to the cultivation of cotton, and considerable quantities of that article, raised in the district, have been disposed of in the Bombay and Manchester markets. Since 1818, when it came into possession of the British, it has undergone a considerable amount of improvement, but is still in a very unsatisfactory state. Pop. about 1,000,000.

DARWEN, Over, a town, England, county Lancaster, in a valley among moorish hills, 3¼ miles south of Blackburn, and on the Bolton, Blackburn, and West Yorkshire Railway; pop. 21,278. It is well built of freestone, and has among its public buildings a parish church and an Independent chapel, both handsome Gothic structures. The staple manufacture is cotton, which employs about 3800 looms. The other manufactures are paper—plain and stained, silk goods, and carpets.

DARWIN, Erasmus, M.D., a physician and poet, was a native of Elton near Newark, in Nottinghamshire, where he was born on the 12th December, 1731. After going through the usual school education at Chesterfield with credit, he was sent to St. John's, Cambridge. There he took his degree as Bachelor in Medicine, and went to Edinburgh to finish his education. After having graduated there he repaired to Lichfield, and commenced practice. Having been so fortunate as to cure a gentleman of fortune in the neighbourhood of a severe fever, after his life had been despaired of, he acquired a great reputation and extensive practice, insomuch that his competitor, feeling himself neglected, quitted the place, and left him the field to himself. Dr. Darwin soon after married a Miss Howard, by whom he had three sons, of whom two died after attaining the age of manhood, and the third, Robert, became an eminent physician at Shrewsbury, and father of the now famous Dr. Charles Darwin, F.R.S. Having lost his first wife, Dr. Darwin married again in 1781, soon after which he removed to Derby, and continued to reside there till his death, which happened in April, 1802, in the seventieth year of his age.

His poem of the Botanic Garden first appeared in 1781. It is comprised in two parts; the first treats of the Economy of Vegetation, the second the Loves of the Plants. The fame it acquired was splendid but very transient, and it has since almost sunk into oblivion. A very ingenious parody, entitled The Loves of the Triangles, published in a monthly journal (and written either by Canning or Frere), was believed, with a good deal of reason, to have contributed to its decline. In 1793 Dr. Darwin published the first volume of Zoonomia, or the Laws of Organic Life; the second volume, completing the work, appeared three years afterwards. The talents and eccentric genius of the author being well known, great expectations were formed of this work, which professed to reform and remodel the whole system of medicine. But the doctrines of materialism contained in the first volume were so glaring that the valuable facts treasured up in the second have been suffered to pass almost unnoticed, and the work has been suffered to fall into a very unmerited neglect. In 1801 Dr. Darwin published a quarto volume entitled Phytologia, or the Philosophy of Agriculture and Gardening, and also a small treatise on Female Education, containing strictures on the pernicious tendency of modern female boarding-schools. Both works contain some valuable and amusing facts.

DARWINISM. See Evolution, Natural Selection, &c.

DASCHKOFF, Catharine Romanowna, Princess of. This celebrated lady, descended from the noble family of Woronzoff, and the early friend and confidant of the Empress Catharine II., was born in 1744, and became a widow at eighteen years of age. She assisted to effect the accession of Catharine to the throne, but at the same time was in favour of a constitutional limitation of the imperial power. In a military dress, and on horseback, she led a body of troops to the presence of Catharine, who placed herself at their head, and precipitated her husband from the throne. The request of the Princess Daschkoff to receive the command of the imperial regiment of guards was refused. She did not long remain about the person of Catharine. Study became her favourite employment. From the Greek and Roman authors she had acquired the high spirit of antiquity. She obtained permission to travel, and visited France, Germany, Italy, and England, where she made the acquaintance of many celebrated personages—Garrick, Dr. Blair, Dr. Robertson, &c. After her return from abroad, in 1782, she was made director of the Academy of Sciences, and president of the newly established Russian Academy. On the death of Catharine in 1796 she was deprived of her offices, and was ordered by Paul III. to retire to her estates at

Novgorod. She wrote much in the Russian language; among other productions, some comedies. She also actively promoted the publication of the dictionary of the Russian Academy. Her death took place in 1810, at Moscow.

DASYURES, a genus of carnivorous marsupials approaching the opossums in their general organization, but wanting the thumb of the hind feet. Their tail is not prehensile like that of their American congeners, and they are consequently incapable of climbing trees. They prey chiefly during the night, feeding on the lesser quadrupeds, birds, molluscs, and the remains of seals or other marine animals cast out by the waves. The species (four in number) are restricted to Australasia. The *Ursine dasyure*, or Tasmanian devil, is an animal of about 21 inches in length, exclusive of the tail, which measures about 7 inches, and is well covered with fur. It has a rather clumsy make, has short, thickset lines, and seldom displays much energy. The general colour of the fur is a deep dead black, with a white stripe across the breast, and another, which is often found contracted into a mere patch, across the end of the spine, just before the insertion of the tail. This fierce little creature, which, despite its small size, is more than a match for most dogs in single fight, was very destructive to the sheep and poultry of the early Australian colonists; but it is now so nearly extirpated out of some districts, by the aid of the gun and trap, that scarcely a solitary specimen can be seen in the locality where they reigned supreme.

DATARIA. See CURIA (PAPAL).

DATE (Latin, *datum*, given), that addition to a writing which specifies the time when it was executed. Under the Roman emperors this word was used to signify the day on which the bearers of the imperial despatches to the provinces received them, or that on which they delivered them. It was also used in documents in the time of the French Merovingian kings. See EPOCH.

DATE, the fruit of *Phœnix dactylifera* (date-palm), the tamar of Scripture, a tree of the natural order Palmæ, inhabiting the north of Africa from Morocco to Egypt, Syria, Persia, the Levant, and India, and also cultivated in Italy and Spain. Dates form the principal nutriment of the inhabitants of some of the above countries, and are an important article of commerce. This fruit is an oval, soft, fleshy drupe, having a hard stone, and when fresh possesses a delicious perfume and taste. Dates are sugary, nourishing, and require no preparation; but when dried, and a little old, as they usually are when imported into Europe and the United States, they are not much esteemed. The best fruits have firm flesh of a yellow colour. They are varied, however, by culture, in size and shape: some varieties are very large, succulent, and without stones. The inhabitants of Tunis and several other countries every year journey in crowds into Biledulgerid to procure dates. The bunches, weighing from 20 to 25 lbs., when of good quality, are sold at from 2*s.* 6*d.* to 3*s.* 10*d.* each. Cattle and grain are received in exchange. Almost every part of this valuable tree is converted to some use. The wood is hard, almost incorruptible, and is used for building. The fronds, after being macerated in water, become supple, and are manufactured into hats, mats, and baskets. The petioles afford fibres from which cordage is made. The fresh young fronds are used as food. The nuts, after being burned, are used by the Chinese in the composition of India-ink. Palm wine is made from the trunk. For this purpose the fronds are cut off, and a circular incision made a little below the summit of the tree, then a deep vertical fissure, and a vase is placed below to receive the juice, which is protected from evaporation. The date-palm is a majestic tree, rising 60 feet and upwards; the trunk is straight, simple, scaly, elegantly divided by rings, and crowned at the summit by a tuft of pendent fronds, 10 or 12 feet long, composed of alternate narrow folioles. The male and female flowers are upon different trees. The fruit is disposed in ten or twelve long pendent clusters. The date-palm is reproduced from seed, from the roots, or from shoots, or by planting the axil of the leaves in the earth, which is the most approved mode, as female plants may be selected, while a few males, scattered here and there, are sufficient. When the male plant is in bloom the pollen is collected and scattered over the female flowers. Each female produces ten or twelve clusters every year, which, when gathered, are hung up in a dry place until so much of their moisture is evaporated as to allow of their being packed. The time of planting is early in the spring. Situations abounding in springs are selected, the trees are placed 15 or 20 feet apart, and a little trench is dug at the root of each, which is filled with water at pleasure, by means of channels excavated in the sand. The Arabs pretend that they attain the age of 200 or 300 years. A considerable traffic is carried on in the fronds, which, under the name of *palms*, are sent to Italy, to be used in the grand religious ceremonies of Palm-Sunday. In Persia an ardent spirit is distilled from the fruit; and in many places the stones are ground to make oil, and the paste that is left is given as food to cattle and sheep.

DATHOLITE, a species in mineralogy found massive and crystallized in the form of oblique rhombic prisms, which are often much modified by secondary planes. It has a shining, vitreous lustre; is of a white, greenish, or yellowish-white colour, and translucent. Before the blowpipe it melts with intumescence, and gives a green colour to the flame. It is readily decomposed by strong acids. Specific gravity 2·9–3. Its composition is as follows:—

	Klaproth.	Rammelsberg.
Silica	36·5	38·477
Lime	35·0	35·640
Boracic acid	24·0	20·315
Water	4·0	5·568
	99·5	100·000

It is therefore a hydrated silico-borate of calcium. It is found in the Kilpatrick Hills, and in Salisbury Crags; in Norway, Sweden, and other parts of the Continent; in the trap-rocks of Patterson, New Jersey, and several other localities in North America. A variety occurring in Norway in grape-like bunches is called *botryolite*.

Another mineral found at Danbury in Connecticut, and hence called *danburite*, is an anhydrous silico-borate of calcium. It forms trimetric, pale-yellow, fusible crystals, and is much harder than datholite. It contains 48 of silica, 22 of lime, 27·7 to 28 of boracic anhydride, along with traces of manganese, alumina and magnesia.

DATISCIN. The bastard hemp, *Datisca cannabina*, a common plant in gardens, indigenous to the Punjab, and largely used in the south of Europe and in Asia for dyeing yellow, yields datiscin, which was first described by Braconnot in 1816. It can be extracted from the leaves and roots by exhausting with alcohol, concentrating, adding water, filtering from a resin, crystallizing and purifying the datiscin obtained. When pure it forms colourless silky needles, which are readily soluble in alcohol, sparingly in ether and in water, and have a bitter taste. It has feeble acid properties, and gives yellow compounds with lead and tin which can be used as dyes. When boiled with dilute acids it is resolved into sugar and *datiscetin*, which crystallizes readily. It is soluble in

alcohol and in ether, almost insoluble in water. It also gives a fine yellow colour with lead. Both substances have been used as dyes.

DATURINE, an alkaloid obtained by Brandes from the thorn-apple, *Datura stramonium*, investigated by several chemists, and identified by Planta with *atropine*, the alkaloid from deadly nightshade, on account of its composition and chemical and physiological properties. Most chemists regard them as the same substance, but some still assign reasons for thinking them different. The action of daturine, however, in enlarging the pupil of the eye, resembles that of atropine, whether the bodies are in other respects the same or not.

The thorn-apple is used in medicine. The alcoholic extract of the seed previously treated with ether, evaporated to a thick syrup, and the tincture of the seed are used in asthma and other disorders of the respiratory organs. The leaf is sometimes smoked.

DAUBENTON, or D'AUBENTON, LOUIS JEAN MARIE, a naturalist and physician, born at Montbard (Côte d'Or) in 1716. He became celebrated for his participation in the Natural History of Quadrupeds by his early friend and companion Buffon; the anatomical part of which was prepared by Daubenton with great accuracy, clearness, and sagacity. He refused his assistance in the latter part of the work, offended at the publication of an edition of the first part by Buffon, in which the anatomical portion was omitted. The cabinet of natural history in Paris, of which he was made keeper in 1745, was, by the united exertions of Daubenton and Buffon, rendered one of the most valuable institutions in the capital. In 1744 he was chosen member of the Academy of Sciences, and enriched its publications by a number of anatomical discoveries, and also by researches concerning the species of animals and their varieties, the improvement of wool, and the treatment of the diseases of animals. He threw much light upon mineralogy, botany, and agriculture, and proposed a new method for the classification of minerals. He contributed to the department of natural history in the Encyclopédie. He is, besides, the author of numerous works of general utility; for example, Instruction pour les Bergers, 1782, Mémoire sur les Indigestions, and many others. Unseduced by Buffon's hypotheses, he was a most faithful observer of nature. He became professor of natural history in the College of Medicine in 1778, and about seven years after professor of mineralogy in the Museum of Natural History. During the reign of terror, when every one was required to give some evidence of patriotic spirit, he was represented to his section as employed in introducing the Spanish sheep into France. He afterwards continued to apply himself quietly to his studies; and though his constitution was naturally weak, the temperance and tranquillity of his life enabled him to reach the age of eighty-four years. During the last year of his life he was made a member of the senate. December 31, 1799, he was present, for the first time, at a sitting of that body, and fell senseless into the arms of his friends from a stroke of apoplexy.

DAUBENY, CHARLES GILES BRIDLE, M.D., botanist, &c., was born at Stratton, in Gloucestershire, of which his father was rector, in 1795. He was educated at Winchester College and at Magdalen College, Oxford, where he graduated B.A. in 1814, and subsequently took the degree of M.D. He practised for some years as a physician in Oxford. In 1818 he visited Auvergne, and in 1837 he made a scientific visit to the United States. In 1822 he was admitted a fellow of the Royal Society, and from 1822 to 1855 he was professor of chemistry in the University of Oxford. In 1834 he became professor of botany, and in 1840 of rural economy in the same university. He held the last appointment till his death. In 1856 he was elected president of the British Association, which met that year at Cheltenham. He died at Oxford, 12th December, 1867. Professor Daubeny made several contributions to scientific literature, which are highly valued. His principal works are, A Description of Active and Extinct Volcanoes (1826); An Introduction to the Atomic Theory (1831; with a supplement, 1840); Report to the British Association on Mineral and Thermal Waters (1836); Lectures on Agriculture (1841); Sexuality of Plants (1860); Climate (1863); with some papers on the Geology and the Thermal Springs of North America, the Volcanoes of Italy and Auvergne, &c.

DAUCUS, a genus of umbelliferous plants, the most important of which is the common carrot (*Daucus carota*). See CARROT.

DAUN, LEOPOLD JOSEPH MARIA, COUNT VON, an Austrian general, was born in 1705, and died in 1766. His grandfather and father had served with distinction in the Austrian army. He served in the Turkish war in 1718, as major-general in Italy in 1734, and distinguished himself at the battle of Krozka in 1737, and the capture of Dingelfingen in 1740. In 1748, after serving against the French in the Netherlands, he was made knight of the Golden Fleece. His skilful passage of the Rhine, and his marriage with the Countess of Fux, a favourite of Maria Theresa, procured for him the post of master-general of the ordnance, and in 1757 that of general field-marshal. During the same year he was made first chief of the order of Maria Theresa. In this capacity he commanded the Austrian army during the Seven Years' war. He advanced to Kollin against the King of Prussia, who was at that time besieging Prague, and gave him battle, June 18, 1757, compelling the king to raise the siege and evacuate Bohemia. Although he conducted his operations with the greatest prudence and precaution, he was defeated at Leuthen, Torgau, and several other places. Except the battle of Kollin, his most memorable achievement was the surprise at Hochkirch, on the night of October 14, 1758. Here he might have destroyed the whole Prussian army had not the Prince of Durlach come up too late with his column. At Torgau, November 3, 1760, the victory which seemed to be within his grasp was snatched from him in consequence of his wounds and the resolution of Ziethen. He compelled the Prussian General Fink to surrender, with 11,000 men, November 21, 1759. He became president of the Aube council in 1762. Daun's plan of delay, and of venturing on decisive steps rarely, and only on great occasions, has been unjustly censured. He could not better resist a general like Frederick the Great, who was not accountable to a superior, and who, surrounded by enemies whom he could oppose successfully only by a rapid succession of victories over the separate armies, was obliged to adopt the boldest expedients. Frederick himself knew what a dangerous antagonist he had in Daun. Daun is more open to the charge of not having sufficiently followed up his advantages. Many improvements in the Austrian infantry are ascribed to him.

DAUPHIN, the title of the eldest son of the King of France. Dauphin was originally a title held by several of the feudal lords of France. The origin of the name is uncertain. In 1349 Humbert II., dauphin of Viennois, being childless, transferred his estate, called the *Dauphiny*, to Philip of Valois, on condition that the eldest son of the King of France should, in future, be styled the *dauphin*, and govern this territory. The dauphin, however, retained only the title, the estates having been united with the crown lands.

On the death of the dauphin his eldest son inherited this title; if he had no son his eldest brother succeeded him. If the king had no son, as was the case in the reign of Louis XVIII., the title of dauphin was not bestowed on any one; for it was never given to the next prince of the blood and presumptive heir, even if he were the king's brother. The wife of the dauphin was called *dauphiness* (*dauphine*). Editions of the classics, made for the use of the dauphin, have been styled 'in usum delphini.'

DAUPHINY (*Dauphiné*), one of the ancient provinces of France. It was divided into Upper and Lower Dauphiné. It forms the departments of the Isère, the Hautes Alpes, and part of that of the Drôme. The capital of the whole was Grenoble. The province constituted a sort of triangle, bounded north by Bresse and Savoie, east by Piedmont, south by Provence, and west by the Rhone.

DAURIA. See DAOURIA.

DAUW, or PEECHI (*Equus Burcheli*), an animal closely resembling the zebra, which inhabits the plains of Southern Africa, particularly to the north of the Orange River. It is about the size of an ass, but more delicately formed. Its general colour is a pale-brown, with grayish-white on the abdomen and inner parts of the limbs. Its head, neck, and body, and the upper parts of its limbs are striped like the zebra, but the stripes are not so dark in colour. It migrates periodically in search of food, and in times of scarcity visits the cultivated lands and makes havoc of the crops. It has been tamed to some extent, but its temper cannot be relied on. The Dutch colonists call it Bonte-quagga.

DAVENANT, SIR WILLIAM, an English poet of the seventeenth century, was the son of an innkeeper at Oxford, where he was born in 1605. After some previous education at a grammar-school, he became a student at Lincoln College; but he soon left the university, and obtained the office of page to the Duchess of Richmond, from whose household he removed into that of Greville, Lord Brooke, a nobleman eminent for his literary attainments. He was employed in preparing several masques for the entertainment of the court; and on the death of Ben Jonson, in 1637, he succeeded to the vacant laurel. On hostilities breaking out between Charles I. and the Parliament Davenant displayed his attachment to the royal cause. Being suspected of a conspiracy against the authority of the Parliament in 1741 he was arrested, but making his escape, went to France. Thence he returned, with military stores sent by the queen, and was made lieutenant-general of ordnance, under the Duke of Newcastle—a post for which he does not appear to have been qualified by any previous service. At the siege of Gloucester, in 1643, he was knighted by the king; and on the subsequent decline of the royal cause he again retired to France, where he became a Roman Catholic, and entered the service of the Princess Henrietta. In 1646 he was sent to England on a mission from the queen; and on his return to Paris he began the composition of his principal work, a heroic poem, entitled Gondibert. An attempt which he afterwards made to lead a French colony to Virginia had nearly proved fatal to him. The ship in which he had sailed from Normandy was captured by a cruiser in the service of the English Parliament, and carried into the Isle of Wight, where Davenant was imprisoned in Cowes Castle. In this forlorn captivity, from which he had but little hope of escaping alive, he composed the third book of Gondibert. In October, 1650, he was removed to London for trial before the high commission court. His life is said to have been preserved by the interposition of Milton. There is a corresponding tradition, that Davenant repaid the good offices of Milton by protecting the republican poet after the Restoration. After two years' imprisonment Sir William was set at liberty, when, with the connivance of those in power, he set on foot, in the metropolis, a species of dramatic entertainments. On the return of Charles II. to England the stage was re-established with renewed splendour, and Davenant became patentee of a theatre in Lincoln's Inn Fields. He continued to employ his pen and his talents as a theatrical writer and manager till his death, which took place April 17, 1668. He was buried in Westminster Abbey. His works consist of dramas, masques, addresses, and the epic Gondibert, which was never finished; but he is remembered chiefly by the reconstruction of Shakspeare's Tempest, in which he was engaged along with Dryden, a work which long held the stage in place of the original, although it has been unequivocally condemned by modern criticism as a vulgar and degraded version of a poem which stood in need of no such emendation.

DAVENPORT, a city, capital Scott county, Iowa, United States, situate at the foot of the upper rapids of the Mississippi, near Rock Island. It is built mostly of brick. The public buildings comprise churches, a college, academies, and schools. Here also are four steam-mills, and water-power unsurpassed in the United States. The first house was erected in 1836. Pop. (1870), 20,038.

DAVENTRY, a borough and market town, England, county of, and 11 miles W. by N. of Northampton, is pleasantly situated on a rising ground, and is in general well built, consisting of two leading and several branch streets, with a church, several chapels and schools, and extensive manufactures of whips and shoes. In the vicinity are numerous interesting Roman remains. Pop. (1871), 4051.

DAVID, King of Israel, the youngest son of Jesse, a citizen of Bethlehem, and member of the tribe of Judah. The life of David is recorded in the first and second books of Samuel and the first book of Chronicles. The book of Psalms, a large portion of which was composed by him, also contains frequent allusions to incidents in his life, which are evidently introduced for allegorical purposes, and are often supposed to apply prophetically to the Messiah, of whom David was an ancestor. During Saul's life, and in consequence of his disobedience to the divine commands, the prophet Samuel was sent to anoint David, who then kept his father's flocks, as King of Israel. David was afterwards recommended to Saul for his skill in music, and played before him to soothe a melancholy distemper to which the king was subject. On the breaking out of war he was sent home, but being sent by his father to inquire after his brothers in the army he slew Goliath, a Philistian giant, who had defied the armies of Israel. Saul again took him to court, but exhibited extreme jealousy of him, and frequently tried to kill him. David escaped through the connivance of Jonathan, Saul's eldest son, who had formed a strong attachment for him. He now became the master of a band, composed in great part of lawless characters, but whom he seems to have disciplined and kept in subordination. He was pursued and persecuted by Saul during a great part of the remainder of that monarch's life. On the death of Saul he was crowned King of Judah at Hebron, and seven years afterwards, at the close of a successful war with Ishbosheth, Saul's successor, was acknowledged King of all Israel. He reigned after this for thirty-three years, extending the dominions of the kingdom of Israel by conquests over the Philistines, Amalekites, Edomites, Moabites, Ammonites, and Syrians. Although generally a just and merciful prince, he committed an act of great oppression in taking

possession of the wife of Uriah, one of his officers, and directing Joab the captain of the host to abandon Uriah at the siege of Rabbah, and permit him to be killed. For this the prophet Nathan predicted great calamities to his family and kingdom, and it was soon followed by the rebellion and death of his favourite son Absalom. Another of his sons, Adonijah, rebelled near the close of his reign. David's penitence for this offence is expressed in several beautiful psalms. He was succeeded by Solomon, his son by Bathsheba, the wife of Uriah. David made great preparations for the building of a temple at Jerusalem, which he had conquered from the Jebusites, but the work was by divine command transferred to his son Solomon, by whom it was carried out. David was born, according to Ussher, B.C. 1085, anointed king 1063, made King of Judah 1055, of Israel 1048, died 1015. Hales places his death in 1030 B.C.

DAVID I. AND DAVID II. See SCOTLAND—History.

DAVID, JACQUES LOUIS, the founder and greatest painter of the modern French school, which he brought back to the study of nature. David was born at Paris, 30th August, 1748, and, after obtaining the grand prize in Paris, went in 1774 to Rome, where he studied from 1775 to 1780, devoting himself particularly to historical painting. His talents for this species of painting soon displayed themselves. He visited Rome a second time in 1784, and finished his masterpiece, the Oath of the Horatii, which Louis XVI. had commissioned him to design from a scene in the Horaces of Corneille. Connoisseurs declared that this piece was unequalled, and breathed the spirit of a Raphael. In the same year he painted his Belisarius; in 1787, the Death of Socrates; and in 1788, Paris and Helen. His reputation was now very great in Paris, and having begun to be distinguished as a portrait-painter also, he might have enjoyed a tranquil and brilliant career, if he had not taken an active part in the revolution. Seized with an ardent zeal for liberty, he finished, in 1789, a large painting representing Brutus condemning his sons to death. He also furnished the designs of the numerous monuments and republican festivals of that time. In 1792 he was chosen an elector in Paris; afterwards a deputy in the national convention; and during the reign of terror he was one of the most zealous Jacobins, and wholly devoted to Robespierre. He proposed to erect a colossal monument of the nation on the Pont-Neuf, from the materials of the king's statue. At the trial of Louis XVI. he voted for his death. In January, 1794, he presided in the convention. After the fall of Robespierre he was in great danger, and his reputation as a painter alone preserved him from the guillotine. Among the scenes of the revolution which David strove to immortalize by his pencil, are the murders of Marat and Lepelletier, and particularly the oath in the tennis court, and the entrance of Louis into the national assembly, February 4, which, in 1790, he presented to the legislative assembly. In 1799 he executed the Rape of the Sabine Women (the masterpiece of his genius), from the exhibition of which he received, as it is said, 100,000 francs. In 1804 the emperor appointed him his first painter, and directed him to execute four pieces, among which the coronation of Napoleon was particularly distinguished. Among his finest works of this period were many representations of the emperor, particularly that in which Napoleon was represented on horseback, on Mount St. Bernard, pointing out to his troops the path to glory. This piece is often engraved. In 1814 David painted Leonidas, his last painting in Paris. When Napoleon returned from Elba he appointed David a commander of the Legion of Honour. After the second restoration of Louis XVIII. he was included in the decree which banished all regicides from France. He then established himself at Brussels, and upon the new organization of the Institute, he was excluded from this body in April, 1816. In Brussels he painted Cupid Leaving the Arms of Psyche. The latest of his productions—Venus, Cupid, and the Graces Disarming Mars—which he finished at Brussels in 1824, was much admired at Paris. David died in exile, at Brussels, Dec. 29, 1825. The opinions of the merits of this artist are various, but the praise of correct delineation and happy colouring is universally conceded to him. He found in the history of his time, in the commotions of which he took an active part, the materials of his representations. The engraver Moreau has immortalized the best of his works, by his excellent engravings. The most celebrated of his paintings, as the Oath of the Horatii, and the Rape of the Sabine Women, were purchased by the French government, and added to the Louvre collection.

DAVID, PIERRE JEAN, a French sculptor, was born at Angers in 1789, and hence is commonly called David d'Angers. He went when very young to Paris, became the pupil of J. L. David, and in 1809 distinguished himself by obtaining a medal of encouragement from the Academy. His bass-relief of Epaminondas having gained the first prize for sculpture in 1811, he was enabled to go to Rome to perfect himself in his art. He passed five years there and then visited London. On his return to Paris he laid the foundation of his fame by a colossal statue of the great Condé in marble. In August, 1826, he was nominated a member of the Academy of Fine Arts, and in December of the same year professor in the School of Painting and Sculpture. He visited Germany twice, in 1828 and 1834, and executed busts of Goethe for Weimar, of Schelling for Munich, of Tieck for Dresden, of Rauch and Humboldt for Berlin. In 1831 he began the magnificent sculptures of the Pantheon, his most important work, which he finished in 1837. He was chosen in 1848 by the department of Maine-et-Loire its representative in the constituent assembly. After the *coup d'état* of 1851 he was forced to go into exile for about three years. He died January 5, 1856. He executed a great number of medallions, busts, and statues of celebrated persons of all countries, among whom we may mention Walter Scott, Canning, Washington, Lafayette, Guttenberg, Cuvier, Victor Hugo, Béranger, Paganini, and Madame de Staël. David worked with great rapidity and ease, and his chief strength consisted in his facility of invention and execution, especially in large works. In works of smaller size his drawing and modelling are seen to be deficient in fineness and accuracy.

DAVID, SAINT (Welsh, *Dewi*), patron of Wales. He was Archbishop of Caerleon and afterwards of Menevia, now St. David's, where he died about 601. He was celebrated for his piety, and many legends are told of his miraculous powers. Several theological treatises are ascribed to him.

DAVID'S, ST. (ancient *Menevia*), a town, Wales, county Pembroke, near the promontory of St. David's Head, and about a mile from the north-west shore of St. Bride's Bay. Though containing only about 2000 inhabitants, it is the see of a bishop, and still exhibits many remains of ancient grandeur. Within a space of 1200 yards in circuit, once inclosed by a lofty embattled wall, of which only fragments now remain, are the cathedral, a venerable cruciform structure, chiefly of the twelfth century, with a finely decorated rood-loft, the episcopal palace, the ruins of St. Mary's college, and other ecclesiastical edifices, chiefly ruinous. The shrine of St. David's was so celebrated that princes have visited it barefoot, and

almost the whole parish, having been considered holy ground, it is thickly strewed with chapels, crosses, or sainted wells. The present residence of the Bishop of St. David's is at Aberguilly, near Carmarthen. Pop. of township, 2131.

DAVIDSON, Lucretia Maria, a remarkable instance of early genius, was born at Plattsburg, on Lake Champlain, Sept. 27, 1808. When she was only four years old a number of her little books were found filled with rude drawings, and accompanied by a number of verses in explanation of them, written in the characters of the printed alphabet. As her parents were in straitened circumstances she was from an early age much employed in domestic services, but every moment of leisure was devoted to reading. A tender heart, a warm sensibility, an ardent and vivid imagination, an eager desire for knowledge, characterize her earlier effusions; the later are marked with the melancholy traces of a wasting frame, and a dejected spirit feeling the fatal approaches of death. According to Southey there is among writers of the English language no instance of so early, so ardent, and so fatal a pursuit of intellectual advancement, except in the cases of Chatterton and Kirke White. In October, 1824, a gentleman who was informed of her ardent desire for education, placed her at a female seminary, where her incessant application soon destroyed her constitution, already debilitated by previous disease. Her letters at this period exhibit in a striking manner the extremes of despondency and hope. Gradually sinking under her malady, she died Aug. 27, 1825, before completing her seventeenth year. Her person was singularly beautiful; her prevailing expression melancholy. Her poetical writings which have been collected amount to 278 pieces, some written at the age of nine years; besides which she destroyed a great number of her pieces.—Her sister Margaret Miller, born 26th March, 1823; died 25th Nov. 1837, exhibited a like precocity. Her poems were introduced to the world under the auspices of Washington Irving. The works of both sisters were published together in 1850.

DAVIE, William Richardson, an American revolutionary officer, was born in England in 1756. He was brought to North Carolina when six years old, and after being educated in North Carolina he graduated at Princetown, New Jersey, in 1776. He commenced the study of law, but soon entered the revolutionary army and obtained a captaincy in Pulaski's legion. He rose to be colonel and commissary, served throughout the war, and was a favourite officer under Sumter and Greene. At the peace he returned to his profession, in which he rose to eminence. Through his influence the University of North Carolina was founded. He was elected governor of that state in 1799, and soon after went as envoy to France. After his return he lived in South Carolina. He died in 1820.

DAVILA, Enrico Caterino, an Italian statesman and historian, was born in 1576. He was the son of a Cypriot of distinguished family. His father, who fled to Venice after the conquest of Cyprus by the Turks in 1561, introduced him to the French court, where he was made page; after this he entered the French service, in which he highly distinguished himself. At the desire of his father he returned to Italy, 1599, entered the Venetian service, gradually rose to the post of governor of Dalmatia, Friuli, and the island of Candia, and was esteemed at Venice the first man in the republic after the doge. While travelling in 1631, on public business, he was shot by a man from whom he demanded carriages to continue his journey. He is principally celebrated for his History of the Civil Wars of France, from 1559 to 1598 (Storia della Guerre Civili di Francia, Venice, 1630). This has been translated into several languages, and deserves a place near the works of Guicciardini and Machiavelli.

DAVIS, John, an English navigator, born at Sandridge, in Devonshire. He went to sea when young, and in 1585 was sent with two vessels to discover a north-west passage. He was unable to land on the southerly cape of Greenland on account of the ice, and steering a N.W. course discovered a country surrounded with green islands, lat. 64° 15′, the inhabitants of which informed him that there was a great sea to the north and west. Under lat. 66° 40′ he reached a coast entirely free from ice, the most southerly point of which he called Cape of God's Mercy. Sailing west he entered a strait from 20 to 30 leagues wide, where he expected to find the passage; but the weather being unfavourable, and the wind contrary, after six days of unsuccessful effort he set sail for England. The strait has since received and retained his name. Davis made two more voyages for the same purpose, but was prevented by the ice from attaining his object, in the prosecution of which Baffin afterwards distinguished himself. He also accompanied the expedition of Cavendish to the Pacific in 1591–93, and made several voyages to the East Indies. In 1605 Davis was killed by Japanese pirates in the Indian seas.

DAVISON, William, a statesman in the reign of Queen Elizabeth, of Scottish extraction, was sent to Scotland as secretary to the ambassador Killigrew, to compliment Queen Mary on the birth of her son. In 1575, when the states of Brabant and Flanders showed strong symptoms of revolt from Spain, Davison was sent thither ostensibly to dissuade them from rebelling, but truly for the purpose of obtaining exact knowledge of the state of affairs. In 1579 he went on a diplomatic mission to Holland; and in security of a large sum advanced by England, took possession of crown jewels which had been pledged to the states by Matthias of Austria. In 1583 he went to Scotland as ambassador, to endeavour to counteract the designs of the French court, and secure the continuance of the alliance with England. When affairs in the Low Countries came to a crisis, and the States had boldly resolved to assert their independence, the alliance with England was concluded by Davison. On his return he was appointed a privy-councillor, and one of the principal secretaries of state (1586). He was afterwards the principal agent in conducting the proceedings against Queen Mary; and though there cannot be a doubt that in all he did he had Queen Elizabeth's sanction, it was determined to endeavour to get quit of the odium incurred by laying the blame upon his shoulders. With this view a number of charges were concocted against him, he was deprived of office, imprisoned in the Tower, tried before the Star-chamber, sentenced to be imprisoned during the queen's pleasure, and fined in £10,000, which reduced him to poverty, and left him without the means of supporting himself in prison. He never returned to favour; and notwithstanding the prominent part he had taken in the transactions of the time, he became so completely forgotten that it is impossible to say how he was ultimately disposed of.

DAVISON, or Davisson, William (he himself writes his name D'Avissone or D'Avissonus), a Scotch physician who flourished in the seventeenth century. He was invited by De la Rivière, physician to Henry IV., to be intendent of the Jardin du Roi, and to occupy the chair of chemistry in it, the first that had been founded at Paris. He held this post for many years, and his lectures were attended by a large number of students from all countries. He was

afterwards appointed physician to the king. Subsequently he went to Poland, where he also obtained the office of royal physician. The dates of his birth and death are not recorded. He is the author of several works. De Sale et lege Salica (8vo, Paris, 1641); Observations sur l'Antimoine (8vo, Paris, 1651); and in Latin: De Natura Antimonii; Collectanea chimica Medica Philosophica Polonica (4to, Antwerp, 1698). He alludes in this work to Plica Polonica, the existence of which as a distinct disease he denies. His principal work is entitled Philosophia pyrotechnica seu Curriculus Chymiatricus (8vo, Paris, 1635). Several editions of it appeared; it was translated into French by Hellot, Paris, 1651, and afterwards in 1675 by the author himself, because, as an old writer remarks, he was perhaps dissatisfied with that which had already appeared. This treatise was intended for his students, and gives an idea of the scope of chemical teaching at that time. The first and second divisions of the book discuss the historical development of views regarding matter, from the Greek philosophers down to Paracelsus and the chemists, and treats of what was then considered the elements of matter. Having thus indicated the place occupied by chemistry, he passes in the third and fourth divisions to the practical part of the subject. He gives a brief explanation of the terms employed, and then the general methods of preparing animal, vegetable, and mineral bodies for use in medicine. This part is perfectly simple, and the processes are easily understood. It does not profess to be complete, but it is obvious that the author was quite familiar with many more substances than those which he selected as examples, and that the chemical phenomena furnished him materials for thought and speculation. Davison was one of the first who took a scientific view of crystallography.

DAVIS' STRAIT, a narrow sea which separates Greenland from Cumberland Island and British North America, and unites Baffin's Bay with the Atlantic Ocean; lat. 60° to 70° N. In the narrowest part, where it is intersected by the Arctic circle, it is 220 miles broad. The east coast is thickly strewed throughout with rocks and islets. The indentations of the west coast are fewer, but deeper, the principal being Hudson's Strait, the entrance to Baffin's Bay, and Northumberland Inlet.

DAVIT, in a ship, a long beam of timber used as a crane whereby to hoist the flukes of the anchor to the top of the bow without injuring the sides of the vessel as it ascends—an operation which is called by mariners *fishing the anchor*.

DAVOUT (popularly DAVOUST), LOUIS NICOLAS, Duke of Auerstädt and Prince of Eckmühl, marshal and peer of France, born in 1770 at Annoux, in the ancient province of Burgundy. He was of a noble family, and studied at the École Militaire of Paris, which he entered in 1785, and left with the rank of sous-lieutenant of the cavalry regiment of Champagne in 1788. He distinguished himself under Dumouriez in the battles of Jemappes (1792) and Neerwinden (1793). When Dumouriez, after the battle of Neerwinden, treated with Coburg, Davout conceived the bold design of seizing the former in the midst of his army, and nearly succeeded in the attempt. In June, 1793, he was made adjutant-general; but the decree which removed the ex-nobles from the service deprived him of his command. The 9th Thermidor restored him to the army. He was present at the siege of Luxembourg (1795), and afterwards on the Rhine, under Pichegru. He was taken prisoner in Mannheim, but was soon exchanged, and distinguished himself in 1797, at the passage of the Rhine, by his prudence and courage. In the Italian campaigns under Bonaparte he became zealously attached to that general. He accompanied him to Egypt, where he distinguished himself by his intrepidity. It was he who, after the battle of Aboukir (July, 1799), attacked and conquered the village. He embarked for France from Alexandria with Desaix, after the Convention of El-Arish. They were captured by a British frigate near the Hières. Bonaparte afterwards gave him the chief command of the cavalry in the army of Italy. After the battle of Marengo he was made chief of the grenadiers of the consular guard, which, from this battle, was called the *granite columns*. When Napoleon ascended the throne (1804) he created Davout marshal of the empire, grand cross of the Legion of Honour, and colonel-general of the imperial guard of grenadiers. In the campaign of 1805 he showed himself worthy of his appointment, particularly at the battle of Austerlitz, where he commanded the right wing of the army. In 1806 he marched at the head of his corps into Saxony, and at Auerstädt, where he commanded the right wing, contributed so much to the success of the day by his skilful manœuvres that Napoleon created him Duke of Auerstädt. After the Peace of Tilsit he was made commander-in-chief of the army of the Rhine. In the war of 1809 against Austria his marches through the Upper Palatinate, and the engagement at Ratisbon, were hazardous enterprises. He had an important share in the victory at Eckmühl. In the battle of Aspern only one of his four divisions was engaged, the greatest part of which, with its general, St. Hilaire, perished on the left bank of the Danube. In the battle of Wagram (1809) Davout commanded the right wing, to the manœuvres of which the retreat of the Austrians was mainly owing. After the peace Napoleon created him Prince of Eckmühl, and in 1811 appointed him governor-general of the Hanseatic departments. In Russia (1812) his division was defeated on the retreat from Moscow. In 1813 he commanded 50,000 men, French and Danes, in Mecklenburg; but was soon besieged in Hamburg, which suffered at that time very severely. Davout was in a critical situation, and could support his army only at the expense of the citizens. He lost, during the siege, as many as 11,000 men. In 1814 he published at Paris a defence of himself from the charge of cruelty towards Hamburg. On the return of Napoleon to Paris in March, 1815, he was made minister of war. When the allies advanced to Paris, after the battle of Waterloo, Davout, as commander-in-chief, concluded a military convention with Blücher and Wellington, in compliance with which he led the French army beyond the Loire. He submitted to Louis XVIII., exhorting the army to follow his example, and in obedience to an order of the king surrendered the command to Marshal Macdonald. For this service he was afterwards employed by the court. Davout died June 1, 1823. Firmness of character, personal bravery, and a military rigour often approaching to cruelty were his characteristics. Davout left two daughters, and a son of thirty years of age, who inherited the rank of a peer.

DAVY, SIR HUMPHRY, BART., one of the most distinguished chemists of the age, was born at Penzance (Cornwall), December 17, 1778. After having received the rudiments of a classical education, he was placed with a surgeon and apothecary, who pronounced him an 'idle and incorrigible boy.' He had, however, already distinguished himself at school, and a taste for chemistry, which he displayed in some experiments on the air contained in sea-weed, attracted the attention of Mr. Gilbert (president of the Royal Society), and Dr. Beddoes. The latter, who had just established a pneumatical institution at Bristol, offered him the place of assistant in his laboratory.

Here Davy discovered the respirability and exhilarating effect of the nitrous oxide. He published the results of his experiments, under the title of Chemical and Philosophical Researches, &c. (London, 1800). This work immediately obtained him the place of professor of chemistry in the Royal Institution, at the age of twenty-two. In 1803 he was chosen a member of the Royal Society. His lectures at the Royal Institution were attended by crowded and brilliant audiences, attracted by the novelty and variety of his experiments, the eloquence of his manner, and the clearness of his exposition. His discoveries with the galvanic battery, his decomposition of the earths and alkalies and ascertaining their metallic bases, his demonstration of the simple nature of the oxymuriatic acid (to which he gave the name of *chlorine*), &c., obtained him an extensive reputation; and in 1810 he received the prize of the French Institute. In 1814 he was elected a corresponding member of that body. Having been elected professor of chemistry to the Board of Agriculture, he delivered lectures on agricultural chemistry during ten successive years, and in 1813 published his valuable Elements of Agricultural Chemistry. His next discovery was of no less importance to humanity than his former researches had been valuable to science. The numerous accidents arising from fire-damp in mines led him to enter upon a series of experiments on the nature of the explosive gas, the result of which was the invention of his safety-lamp. In 1818 and 1819 he visited Italy, and made some unsuccessful attempts to unroll the Herculanean manuscripts. In 1820 he succeeded Sir J. Banks as president of the Royal Society. In 1824 he visited Norway for the purpose of making some scientific investigations. On this voyage he proved the efficacy of his plan for preserving the copper of ships, by covering it in part with a certain quantity of iron. The discovery, however, proved of no value, because the bottoms of vessels thus protected became so foul as speedily to compel its abandonment. This distinguished philosopher died May 29, 1829, at Geneva, whither he had gone for the benefit of his health. Besides the works already mentioned, the most important are Electro-Chemical Researches; Elements of Chemical Philosophy (vol. i. 1802); Bakerian Lectures (1807–11); Researches on the Oxymuriatic Acid (1810); On the Fire-damp (1816). He also contributed some valuable papers to the Philosophical Transactions, and the journals of Nicholson and Tilloch. His biography has been written by Dr. Paris and by his brother Dr. Davy; and his writings were collected by his brother, and published in 1839–40 in nine volumes. A statue was erected to him at Penzance in 1872.

DAWK, a sort of palanquin, or Indian carriage, frequently used for travelling post. The Indian traveller usually purchases his own carriage, which is borne on the shoulders of native bearers, who are provided by the postmaster at the different stations, which are about 10 miles apart. The carriage may be sold at the end of the journey.

DAWLISH, a village, Devonshire, England, 2½ miles N.N.E. of Teignmouth, beautifully situated at the entrance of a valley running inland from the English Channel. Its genial climate renders it a place of great resort for invalids and others. Pop. in 1871, 3622.

DAX (ancient *Aquæ Augustæ Tarbellicæ*), a town and watering-place, France, department of Landes, on the left bank of the Adour, with 9469 inhabitants. It consists of the town proper, surrounded by old ramparts partly Roman, and of a suburb called Sablar, on the opposite side of the river, and communicating with it by a bridge. The principal edifices are the castle, the high church, once a cathedral, the bishop's palace, now occupied as public offices, the communal college, &c. The manufactures are stoneware and liqueurs, and the trade is in wine, ham, preserves, &c. The chief attraction of the place is its thermal springs, which have temperatures varying from 86° to 166° Fahr., were much frequented by the Romans, and are still in great repute for the cure of rheumatic and similar complaints. A market-place, an assembly-room, and a handsome thermal establishment were erected here in 1868–69.

DAY. The word *day* is used with several different senses. Its most ancient meaning is the period of light as opposed to the period of darkness, and in this sense it is still quite commonly used. Its most common application, however, is to the period of light and that of darkness together, but even in this sense there are different days. The *sidereal* day is the time that elapses between two successive culminations (see CULMINATION) of any particular fixed star, or, in other words, is the time occupied by a revolution of the earth round its axis. The *solar*, *astronomical*, or *apparent day* is the time that elapses between two successive returns of the same terrestrial meridian to the centre of the sun. This period is not always of the same length, and its mean length gives us the *mean solar* or *civil* day. The twenty-four hours of the sidereal day are numbered in succession from one to twenty-four, whilst the civil day in most countries is divided into two portions of twelve hours each.[1] The abbreviations P.M. and A.M. (the first signifying *post meridiem*, Latin for *afternoon;* the latter *ante meridiem*, *forenoon*) are requisite, in consequence of our division of the day into two periods of twelve hours each. In this respect the mode of numbering the hours from one to twenty-four consecutively has an advantage. If we take a day according to the second definition given of it (that is, a sidereal day), its length, of course, is the same throughout the year (see SIDEREAL TIME). The solar day, in consequence of the varying rapidity of the earth in its orbit, and the obliquity of the ecliptic, is different at different times (see SOLAR TIME), and this difference is uniform throughout the earth; but the time of the natural day (or period of light) is different at the different points of the earth, according to their distance from the equator. The daily apparent revolution of the sun takes place in circles parallel to the equator. If the equator and ecliptic coincided, the circle bounding light and darkness would always divide, not merely the equator, but all its parallels, into two equal parts, and the days and nights would be equal in all the parallels through the year; but at the poles there would be no night. Owing to the inclination of the earth's axis to the plane of its orbit (the ecliptic), the parallel of latitude in which the sun appears to move is continually changing; and therefore the equator alone (being a great circle) always remains bisected by the circle dividing light from darkness; so that the days and nights here are always equal; while the parallels of latitude, not being great circles, are not equally divided by the circle separating light from darkness, except at the time of the equinox, when the sun is moving in the equator; and, of course, at this time only are the days and nights equal in those parallels. As you approach the poles the inequality between the days and nights becomes continually greater, till, at the poles themselves, a day of six months alter-

[1] In Italy the latter division is called the *French mode*, because the French introduced it into that country during the wars of the revolution; but the people in the south of Italy still adhere to the old division of the day into twenty-four hours, beginning always at sunset; so that one o'clock is one hour after sunset, or as the bells are tolled at sunset, to summon the people to prayer, one hour after *Ave Maria*.

nates with a night of equal duration. The most distant parallel circles which the sun describes north and south from the equator are, as is well known, only 23½° from it. The distance between the polar circles and the poles is the same. Therefore, as a little reflection will show, when the sun is in one of the tropics, all the polar circle in the same hemisphere will be within the illuminated region (because it will be within 90° of the sun) during the whole of a diurnal revolution, while the other polar circle will be in the region of darkness. These circles, therefore, have one day of twenty-four hours, and one night of the same length in each year. From the polar circles to the poles the time of the longest day increases fast, and in the same measure the length of the longest night. Notwithstanding the inequality of the periods of light and darkness in the different parts of the earth, each portion of the earth's surface has the sun above its horizon every year precisely six months, and below it the same length of time.

DAY, THOMAS, an ingenious writer, of a benevolent, independent, but eccentric spirit, was born at London in 1748. His father, who was a collector of the customs, died whilst he was an infant, leaving him a considerable fortune. He was educated at the Charter House and at Oxford. In 1765 he was called to the bar. With a view to study mankind he resided in various parts of the Continent, and having been disappointed in an early affection, took under his protection two foundling girls, with a view of educating them on a principle of his own, in order to make one of them his wife. His plan, which was kindred in spirit to some of the reveries of Rousseau, utterly failed, although both of the females turned out deserving women. He gave them small portions, and eligibly united them to respectable tradesmen. In 1778 he married Miss Esther Milnes, a lady of a highly cultivated understanding. His principles led him to renounce most of the indulgences of a man of fortune, that he might bestow his superfluities upon those who wanted necessaries; and he also expressed a great contempt for forms and artificial restraint of all kinds. He wrote, in prose and verse, on various subjects, but finally dedicated himself to the composition of books for youth, of which the well known work entitled History of Sandford and Merton is an able specimen, although it partakes too much of the theoretical spirit of Rousseau for general application. Mr. Day at length became a victim to his enthusiastic benevolence, being killed by a fall from a young horse, which he would not allow to be trained in the usual manner, September 28, 1789.

DAYAKS, or DYAKS. See BORNEO.

DAY BOOK. See BOOK-KEEPING.

DAYSMAN, in English law an arbitrator or elected judge. This term is antiquated. It occurs in the book of Job, ch. ix. 33.

DAYS OF GRACE are days allowed for the payment of a promissory note or bill of exchange after it becomes due. The time varies in different countries. See BILL OF EXCHANGE.

DAYTON, a town, United States, Ohio, capital of Montgomery county, at the confluence of the Mad and Great Miami rivers, 66 miles W.S.W. from Columbus. It is a place of great industrial activity, a centre of railway communication, and one of the most important inland cities of the Union. It is regularly and handsomely built, and contains some splendid public edifices, among which may be mentioned more especially the county courthouse, built of marble, after the model of the Parthenon. There are extensive manufactures of iron, paper, oil, beer, cotton, woollen, machines, and agricultural implements. Pop. in 1870, 30,473.

DEACON (*diaconus*, from the Greek *diakonos*), a person who belongs to the inferior order of ministers in the Christian church. Seven were apparently first instituted by the apostles (Acts, chap. vi.), which number was retained a long time in several churches. Another interpretation has, however, been given to Acts vi., according to which the seven were not appointed as deacons, but as superintendents of a larger body of deacons. Their duty was to serve in the *agapæ* (see AGAPE), to distribute the bread and wine to the communicants, and to dispense alms. The office of the deacons at first merely concerned things temporal. Soon after the apostolic age, or perhaps during it, the deacons were admitted to assist in the inferior parts of the church service.

Deacon in the Roman Catholic Church, is an inferior ecclesiastic, the second of the sacred orders. He serves at the altar in the celebration of the holy mysteries. He is also allowed to baptize and to preach with the permission of the bishop. Formerly deacons were allowed to marry, but this was prohibited very early; and at present the pope dispenses with this prohibition only for very important reasons. In such cases they re-enter the condition of laymen. There are eighteen *cardinal-deacons*, so called, in Rome, who have the charge of the temporal interests and the revenues of the church. A person to be consecrated deacon must be twenty-three years old.

In the English Church deacons are also ecclesiastics, who can perform all the offices of a priest, except the consecration of the elements of the Lord's supper, and the pronouncing of absolution. In this church, also, no person can be ordained deacon before he is twenty-three years old, except by dispensation from the Archbishop of Canterbury.—The office of deacons in Presbyterian churches is sometimes filled by the elders. In the Free Church of Scotland there are both elders and deacons, and in the United Presbyterian Church the functions of deacons are performed by a body called managers. In German Protestant churches the assistant ministers are generally called *deacons*. If there are two assistant ministers, the first of them is called *archdeacon*. In Scotland this name is given to masters or presidents of incorporated companies.

DEACON (Scotch law). Until the passing of the Burgh Reform Act for Scotland (3 and 4 William IV. cap. lxxvi.) the deacons of the crafts formed a constituent part of the town-council in royal burghs as representatives of the trades. By the act referred to the trades are permitted to elect deacons for the management of their own affairs, without interference of the town-council, but the deacons no longer form part of the municipal body. The deacon is preses of his corporation and signs its acts. Formerly he exercised a jurisdiction over the rest of the trade.

DEACONESS. This name was given to women in the early church, who consecrated themselves to the service of the church, and rendered those offices to females which could not be decently performed by men. They also had the care of the poor, the sick, &c.

DEACON'S PROCESS. See CHLORINE.

DEAD BEAT ESCAPEMENT, in clockwork, a mechanical contrivance intended to modify and regulate the effect of wheel-work on the action of the pendulum of a clock. It was invented by George Graham about the beginning of last century. The object desired to be attained was to avoid the recoil produced by the action of common escapements, which may be observed by watching the seconds hand of an ordinary clock. This recoil is a source of error when great accuracy is required. With the escapement invented by Graham no recoil is produced on the wheel, however far the pendulum may swing.

DEAD-EYE, or DEAD MAN'S EYE, a sort of round flattish wooden block, encircled with a rope, or with an iron band, and generally pierced with three holes through the flat part, in order to receive a rope called the *lanyard*, which, corresponding with three holes in another dead-eye, creates a purchase employed for various uses, but chiefly to extend the shrouds and stays, otherwise called the *standing rigging*. The term *dead* seems to be used to indicate the absence of a revolving sheave to lessen the friction. The dead-eyes used for stays have only one hole, but it is large enough to receive ten or twelve turns of the lanyard.

DEAD-LIGHTS are strong wooden shutters fitted on the outside of the cabin windows of a vessel, so as to close them tightly in bad weather.

DEADLY NIGHTSHADE. See NIGHTSHADE.

DEAD OIL. In utilizing crude coal-tar, the first operation to which it is subjected is distillation in large iron retorts. The first runnings consist of ammoniacal water and some oil; this after a time stops, and light oil, comparatively free from water, comes over, and is collected in another receiver. Then as the temperature rises a yellow oil distils, which is tested by allowing a few drops to fall into water. If it sinks in the water the receiver is again changed and what runs into it constitutes *heavy* or *dead oil*. The composition of the crude oil varies of course with the tar and the care bestowed on its rectification, but the following substances, all boiling considerably above 320° F., have been obtained from it:—carbolic acid, cresylic acid, phlorylic acid, aniline, parvoline, coridine, naphthaline, rubidine, leucoline, viridine, lepidine, anthracene, chrysene, pyrene; and there are probably several others yet to be got. The dead oil is often used in the crude state for preserving timber by the carbolic acid which it contains. After separating the carbolic acid and naphthaline the heavier portions have been used for lubricating machinery. Now, the anthracene is of the greatest value for conversion into alizarine.

DEAD RECKONING, the judgment or estimation which is made of the place where a ship is situated, without any observation of the heavenly bodies. It is obtained by keeping an account of the distance which the ship has run by the log, and of her course steered by the compass, and by rectifying these data by the usual allowance for drift, leeway, &c., according to the ship's known trim. This reckoning is, however, always to be corrected as often as any good observation of the sun can be obtained.

DEAD ROPES are those which do not run in any block.

DEAD SEA (Latin, *Lacus Asphaltites;* Arabic, *Birket Lut*, or *Bahr Lut*—'the Sea of Lot'), called in Scripture 'Salt Sea,' 'Sea of the Plains,' and 'East Sea,' a celebrated lake in Asiatic Turkey, near the south extremity of Palestine, in the pashalic of Damascus. The north extremity is 25 miles east of Jerusalem, and 10 miles south-east of Jericho; length, north to south, about 46 miles; breadth at the widest part, 9 to 10; average, about 8½ miles. The general form of the lake is that of an elongated oval, interrupted towards its south extremity by a peninsular projection, which, running out from the east shore towards the opposite coast till it has reached the centre of the lake, narrows the breadth at this point to about 2 miles, and forms almost a small separate lake of the south portion, measuring 9½ miles north to south, with an average breadth of about 8 miles, whose south shore is a mud-flat backed by hills. The basin or hollow in which the Dead Sea reposes forms the south termination of the great depression through which the Jordan flows, that river entering it at its north extremity. The surface of the lake is 1312 feet below the level of the Mediterranean, and 984 feet below Lake Tiberias, from which the Jordan issues. It lies deeply embedded between lofty cliffs of naked limestone, its shores presenting a scene of indescribable desolation and solitude, encompassed by desert sands, and bleak, stony, salt hills, excepting where there are fresh-water streams, in which localities the shores are fertile. Lofty mountains, exhibiting frightful precipices, rise on the east shore to the height of 2000 and 2500 feet above the water, and on the west the rocky barriers attain an elevation of 1500 feet. The waters of the Dead Sea are intensely salt, bitter, and acrid, thick, and heavy, and so singularly buoyant, from the quantity of salt held in solution, that a person bathing in them floats without effort, like a block of wood, and is so slightly immersed as to be hardly able to obtain sufficient purchase in the water to enable him to propel himself forward. Their specific gravity is nearly a fourth more than that of rain water. Chlorides of magnesium, sodium, and calcium, together with an extraordinary quantity of bromide of magnesium, are the chief constituents of the solid matter. The lake formerly enjoyed a therapeutic reputation, and lepers in particular were sent to bathe in it. A strong smell of sulphur, arising from springs impregnated with sulphuretted hydrogen, pervades some parts of the western shore. The general colour of the waters of the lake is of a very dark blue, though in some places near the shore it assumes that of a dark bottle green. It was long supposed that no life whatever existed in the lake, but some lower organizations have recently been found in it. The statements of ancient travellers that no living creatures could exist on its shores, and that even birds could not fly across its surface because of the pestiferous vapours arising from its waters, have been entirely refuted by more recent and accurate observation. The appearance of the Dead Sea is not what popular imagination has painted it. It is described as a calm, glassy lake, with a smooth beach, surrounded by mountains of rare beauty, and brilliantly illuminated by a Syrian sun, but the overpowering heat, and the burnt and sterile appearance of the shores afford some justification of its name. On the borders of the lake pieces of sulphur as large as walnuts are found in great quantities, also the black bituminous limestone of which so many trinkets are made at Bethlehem and Jerusalem, including rosaries, of which great numbers are sold to the pilgrims who visit the sacred places. The asphaltum or bitumen, from which the lake takes one of its names, is not very abundant on the shores, and large masses are found after earthquakes only. At about a third of its length from the north end it attains a maximum depth of 1308 feet. The southern portion is a mere lagoon, 12 feet deep in the middle and 3 at the edges. It has no visible outlet, although it receives six streams besides the Jordan, its surplus waters being carried off by evaporation. It was long assumed that this lake did not exist before the destruction of Sodom and the other 'cities of the plain,' and that, previously to that time, the present bed of the lake was a fertile plain, in which these cities stood, and was then merely traversed by the Jordan, which, in accordance with this theory, was supposed to hold on its course to the Red Sea, flowing through El-Arabah by a channel, now dry, called Wadi el Gharandel; but the fact of the Dead Sea being far below the level both of the Red Sea and the intervening tract El-Arabah renders this assumption a physical impossibility, while the idea that any convulsion of the earth had occurred at the period of the catastrophe alluded to sufficient to form the vast cavity in which the lake

is situated is very satisfactorily shown by Dr. Wilson to have been highly improbable. Some eminent critics, including Professor Robinson and Dr. Wilson of Bombay, are of opinion that the cities of the plain may probably have stood on the part of the lake south of the promontory—the lake, by this supposition, receiving an extension merely when these cities were destroyed. A circumstance, however, brought to light by the survey of the sea in 1848 by Mr. Lynch would seem to militate strongly against this hypothesis, namely, the extreme shallowness of the water in this locality, the soundings nowhere exceeding 2½ fathoms, or 15 feet, a depth which must be regarded as wholly insufficient to submerge the cities of the plain, unless it be supposed that they are buried in the soft mud everywhere found on the bottom in this part of the lake.

DEAF AND DUMB. The sensation which we call *hearing* is produced by the vibrations of the air striking on the tympanum or drum of the ear, and communicated to the auditory nerve by means of a series of small bones connected in a very remarkable manner. When the tympanum becomes insensible to these impulses a person is termed *deaf*, although the vibrations may still be communicated in some cases through the bones of the head by means of a stick placed between the teeth, or, as the Code of Justinian states to have been practised in the case of dying persons, by speaking with the mouth close to the top of the head. The Eustachian tube extends from the tympanum into the mouth; and sometimes sounds are better distinguished by opening the mouth when the external opening only is obstructed, hence the habit of 'listening with the mouth open.' Deafness occurs in every degree, from that which merely impairs the accuracy of the ear in distinguishing faint or similar sounds to that state in which there is no more sensation in this organ than in any other; and sound is felt in almost every part of the body as a mere vibration.

Articulation and Dumbness.—Articulation is acquired by imitating the sounds which we hear uttered by others, and correcting the voice by means of the ear until the imitation is precise. Deafness, therefore, in every degree, affects the distinctness of articulation, and if it is so great that the subject can no longer distinguish between articulate sounds he is incapable of acquiring speech in the ordinary manner, and becomes dumb in consequence of his deafness. A case has occurred within the knowledge of the writer in which entire deafness, taking place at the age of eighteen, so affected the articulation that the individual was no longer intelligible, even to his friends. This result will not be prevented by any degree of hearing less than we have mentioned, for most deaf and dumb persons can hear some sounds, and some can distinguish the high from the low who perceive no difference in articulations. Only a few mutes are found, who owe this defect to feebleness of mind or to any imperfections in the organs of speech. These remarks show the fallacy of the idea that the want of speech is owing to the want of mental capacity—a prejudice which has been cherished by the usual name of *deaf and dumb*, which we hope, for this reason, as well as for euphony, will be changed for that of *deaf mute*, which may be employed both as a noun and an adjective.

Causes and Cure.—The immediate causes of ordinary dumbness are known to be various. In some few cases it is owing to an imperfection or injury of some part of the organs of speech, and, of course, is irremediable. In other cases it seems to arise from obstructions in the external or internal passage of the ear. Cures have sometimes been effected by removing these obstructions by means of instruments or injections. This was done especially by Itard and Deleau of Paris, who threw injections into the Eustachian passage by means of a flexible tube passed through the nostrils. Dr. Deleau is reported by a committee of the French Institute to have relieved or cured several deaf persons by injections of *air*, long continued; but he did not estimate the probable number of cures in deaf mutes at more than one in ten. Perforation of the tympanum is sometimes useful in rendering it more easy to remove obstructions which may be discovered; and for this purpose it is deemed important to perform it by means of circular discs, closing with a spring, which remove a portion of the membrane, and leave a permanent opening. In other cases, and in the usual mode, this operation often produces great suffering, and has not been generally useful. In eighty-one cases of perforation at Groningen in Holland only three were permanently relieved, and these in a very partial degree. In the greater proportion of deaf mutes no defect is visible, and no applications appear to be useful. In a number of anatomical examinations of deceased deaf mutes at Paris the ear was found perfect in all its parts. The inference has therefore been made that the disease consists in a paralysis of the auditory nerve—a conclusion which seems to be sustained by the fact that in some cases a cure has been effected by actual cautery on the back of the head, and that galvanism has sometimes given temporary relief.

Communication—Natural Language.—The necessity of communication, and the want of words, oblige the deaf mute to observe and imitate the actions and expressions which accompany various states of mind and of feeling, to indicate objects by their appearance and use, and persons by some peculiar mark, and to describe their actions by direct imitation. In this way he and his friends are led to form a dialect of that universal language of attitude, gesture, and expression, by which the painter and the sculptor convey to us every event of history, and every feeling of the soul; which becomes a substitute for words in the hands of the pantomimic actor, and which adds force and clearness to the finest effusions of the orator; in other words, the natural *sign language*.

Description of the Language.—The terms of this language are of two kinds, the descriptive and the characteristic or indicative signs. Descriptive signs involve an account, more or less complete, of the appearance, qualities, and uses of an object, or the circumstances of an event, for the purpose of description or explanation; and must, from their nature, be varied, like a painting, only by the point of view from which the objects are described, or the capacity and accuracy of the person that describes. The indicative signs, on the contrary, which are employed in common conversation, are usually mere abbreviations of these, involving a single striking feature of the person, or object, or event; as an elephant is indicated by its trunk, a flower by its fragrance, or a town by a collection of roofs. The signs of persons are usually conventional, and derived from some feature, or mark, or habit, but often from an accidental circumstance in dress, &c., which struck the deaf mute on first seeing the person, and is still referred to when it no longer exists. It is obvious that, in this class of signs, there is great room for dialects, according to the situation, capacity, and habits of observation of the individual, and that much may be done for its improvement by a proper selection.

Extent of the Sign Language.—The sign language, like every other, varies in its extent with the intelligence, the wants, and the circle of ideas of those who use it. When employed by an insulated deaf mute, it will usually exhibit only the objects of the first

necessity, and the most common impulses, like the language of a savage tribe. When his ideas expand from age or observation he will find new modes of expressing them; and when his education is begun, an intelligent deaf mute will often express ideas in this language for which it is difficult to find expression in words. When a number of deaf mutes are brought together in a single institution, selections and combinations of their various dialects are formed; the best are gradually adopted by all; and a new and more complete form of the language is the result—as in nations collected by civilization. This process, carried on for half a century in the institution of Paris, and some others in Europe, under the observation and direction of intelligent men possessed of hearing, has produced a language capable of expressing all the ideas we convey by articulate sounds with clearness, though not always with equal brevity, and which those who value it least admit to surpass speech in the force with which it communicates the feelings and states of mind. Like painting (as Condillac observes) it has the immense advantage of presenting a group of ideas at once, which lose much of their force and beauty by being detailed in the successive words and artificial arrangements of written language. The eye, the hand, the whole body, speak simultaneously on one subject; the representation changes every moment, and these peculiarities, with the elliptical form of expression which is adopted in conversation, give a rapidity to communication by the sign language which, on common subjects, among those familiar with it, surpasses that of speech. If we remark the new shades of meaning given to the same words by the varying attitude and general expression of the speaker, and the accuracy with which a nice observer will discover, in these signs, the thoughts, and feelings, and intentions, even of one who wishes to conceal them, we shall find reason to believe that they are capable of conveying the most delicate shades of thought. Generic and abstract terms, as their objects do not exist in nature, have no corresponding terms of equal clearness in the sign language; and the abbreviated manner in which we express relations by conjunctions, prepositions, relatives, and inflections, can only be imitated by adopting similar conventional signs, which do not easily fall in with the idiom of the language. In these respects, therefore, the sign language wants the algebraic brevity and accuracy which are found in artificial languages, and which render these so invaluable as mediums of thought and instruments of philosophical investigation; at the same time it is capable of describing what is conveyed by these forms with an accuracy at least as great as that of words, by circumlocution and example. It is worthy of remark that the order of expression in the sign language is that which we term *inverted*—the subject before the quality, the object before the action, and, generally, the thing modified before the modifier. This language, in its elements, is to be found among all nations, and has ever been the medium of communication between voyagers and the natives of newly discovered countries. It is employed by many savage tribes to supply the paucity of expression in their language, or to communicate with other tribes, as in the Sandwich Islands and in North America. Among the Indians of the western territory of the United States Major Long found it an organized language employed between tribes who spoke different articulate languages. The accounts received from himself, as well as his work, show that it corresponds, almost precisely, with that in use in the school of Paris; and a Sandwich Islander, who visited the American asylum for deaf mutes, gave a narrative of his life in the sign language, which was perfectly understood by the pupils. If testimony be wanting that it still retains its universal character in its cultivated form, the writer of this article, who acquired it in this form, can state that he has employed it, or seen it employed, with success, in communicating with an American Indian, a Sandwich Islander, a Chinese, and the deaf and dumb in various parts of the United States, in England, Scotland, France, Germany, Switzerland, and Italy. The more lively nations of Europe, belonging to the Celtic race, the French and Italians, &c., make great use of this language in connection with words, and sometimes even without them. The more phlegmatic people of the Teutonic race, in England and Germany, are so little disposed to it, and so much less able to acquire or understand it, that they regard it as a species of affectation or buffoonery in their southern neighbours; and to this circumstance it is probably owing that it has been so extensively rejected among these nations as an auxiliary in the education of the deaf mute.

Natural State of the Deaf Mute.—The natural condition of the deaf mute may be inferred from the account we have given of his language. It is obvious that the mere loss of hearing cannot in itself diminish the natural vigour of any other faculty, either of body or mind. He must, however, be destitute of all ideas of sounds; but these form so small a part of the circle of our ideas, in comparison with those derived from sight, that they cannot seriously affect him. His conceptions, derived through the medium of sight, are usually more accurate than ours, his recollections more vivid, and his powers of description more striking, because his attention is more undivided. His discrimination of feelings and character is often intuitive, and he frequently divines the subject of conversation from the appearance of the speaker. The tremendous part of his misfortune is the interruption of communication with his fellowmen on all subjects except the primary wants and impulses, which arises from the imperfect character of his sign language in an uneducated state. His ideas are very much limited to the objects and events he witnesses, and the exterior relations of things; and he is shut out from all the knowledge derived from history and tradition. Past ages, distant countries, a future world, a Deity, are all beyond his reach. In regard to the combination and application of the ideas which he acquires, he is still in the state of nations in the infancy of society, and cannot be aided or directed by others in his efforts to reason. After extensive observation and inquiry, we cannot hear of or find a single instance in which a person born deaf has conceived of a first Cause, from a view of the works of nature, without education. They describe themselves as looking at these objects like the brutes. Even those to whom their friends have made great efforts to communicate religious truths seldom have an idea of the Deity as a Creator or Benefactor; and a deaf mute at Chartres, in France, who had been taught to perform all the rites of the Catholic Church, and was deemed very devout, on receiving his hearing stated that he had no conceptions of anything but the external forms of religion. Conscience, in them, derives all its light from the observation of the conduct of others, and the instinctive impulses, but recognizes no invariable law, and often leaves these unfortunate persons to commit gross crimes without any sense of guilt. In short, they are enveloped in intellectual and moral darkness, in the midst of the clearest light.

History of the Art of Instruction.—Mention is made of deaf mutes in the writings of Pliny; and they were declared by the Code of Justinian incapable of

civil acts. No attempts appear to have been made to give them instruction until the middle of the fifteenth century, when we are merely told by Agricola, professor of philosophy at Heidelberg, in Germany, of a deaf mute who had been instructed. In the middle of the sixteenth century, Pascha, a clergyman of Brandenburg, instructed his daughter, a deaf mute, by means of pictures. But the first effort for this interesting object, of which we have a distinct account, was made by Pedro de Ponce, a Benedictine monk, of the Spanish Kingdom of Leon, who instructed three deaf mutes, of noble families, to write and speak, in 1570. His system appears to have been adopted by a countryman of his, a monk, John Paul Bonet, who, in 1620, published a treatise on the art of instructing the deaf and dumb, accompanied by a manual alphabet. In 1648 Mr. John Bulwer published the earliest work in English on the instruction of the deaf and dumb, entitled Philocophus; or, The Defe and Dume Man's Friend; and subsequently, Chirologia; or, The Natural Language of the Hand. These were followed by Dalgarno's Ars Signorum Vulgo Character Universalis, et Lingua Philosophia in 1661, and Dr. W. D. Holder's Elements of Speech; an Essay of Inquiry into the Natural Production of Letters; with an Appendix concerning Persons that are Deaf and Dumb, in 1669. Dalgarno, who was a native of Scotland, likewise published, in 1680, Didascalocophus; or, The Deaf and Dumb Man's Tutor, a work of considerable merit. To Dr. John Wallis, however, Savilian professor of mathematics at Oxford, is generally ascribed the merit of having been the first Englishman who succeeded in imparting instruction to deaf mutes. The results of his labours on his first pupil were exhibited before the Royal Society in 1662; and in 1698 an essay of his on this subject was published in the Philosophical Transactions. Contemporary with these philanthropists in England were Baron F. von Helmont and Dr. John Conrad Amman, in Holland, the latter of whom published in 1690 his celebrated work, Surdus Loquens. Towards the middle of the eighteenth century various teachers arose in different parts of Europe. In 1743 the practicability of instructing deaf mutes was first publicly demonstrated in France by Pereira, a Spaniard, before the Academy of Sciences, which gave its testimony to the success of the method. About the same time the Abbé De l'Epée, who devoted his life and fortune to this subject, introduced a system for the instruction of the deaf and dumb, which was taught with great success in the Royal Parisian Institution, and afterwards still further developed by his pupil and successor, the Abbé Sicard. In 1779 a public institution for the education of deaf mutes was established at Leipzig, through the labours of Samuel Heinicke, the great upholder of the vocal or articulatory system, which is still retained at Vienna and throughout Germany. About twenty years previously Thomas Braidwood had established near Edinburgh in 1760 a deaf and dumb school on the articulating system, which was visited by Dr. Johnson during his tour in Scotland. It was removed in 1783 to Hackney, near London. A day school for the instruction of deaf mutes was established by Don Pascal de Pietro at Rome in 1784. The first public institution in Great Britain for the gratuitous education of the deaf and dumb was founded at Bermondsey in 1792 by the Rev. Messrs. Townsend and Mason, and intrusted to the superintendence of Dr. Watson, a nephew of Braidwood. From this establishment originated the London Asylum in Kent Road, which was opened in 1807. In 1810 a school for affording instruction gratuitously to the dumb was founded in Edinburgh, and others of a similar description were subsequently established at Birmingham, Glasgow, Manchester, and other towns. A church has been erected in London for the religious services of the deaf and dumb alone.

Systems of Instruction.—The objects to be accomplished in the education of a deaf mute are to teach him an entire language, and to give him all that mass of moral, religious, and ordinary knowledge that is necessary for him as a social and immortal being, for which, in other children, twelve or fifteen years of constant intercourse with society, and much study, are deemed necessary; all this is to be done in six, and often even in three years. It is obvious that to accomplish this, some method, more rapid in its results than the ordinary one, must be adopted. The earlier instructors of the deaf mute usually had only one, or a very few pupils, and have given us *hints* for instruction, rather than a system. The first account which we have of the reduction of this art to a regular and permanent form is in the works of Heinicke and De l'Epée. Heinicke, like many of his predecessors, considered the want of speech as the great misfortune of the deaf mute, and made it the great object of instruction to teach him to articulate in order to aid the progress of his own mind, as well as to enable him to communicate with others in this manner. We are told by the successor of Heinicke in the Leipzig school that the following 'are and were the views and principles of Heinicke and his disciples:'—that 'we think in articulate words, and cannot think in written words:' 'that written words can never lead to the development of ideas in children born deaf;' and that 'no freedom in thought, or in the use of language, can be produced without articulation, either by signs or by written language.' If it were credible that sounds were more allied to abstract ideas than objects of sight are; if we could forget that we often have ideas for which we cannot easily find words, the facts we have stated concerning the language of signs, and the capacity of several hundred pupils, educated merely by signs, in the French and American institutions, to read and write, and converse and reason, prove the entire fallacy of these views; and the argument *ab ignorantia* cannot be adduced at this day on that subject without disgrace. Those who followed this system admit the use of the sign language in the early stages of instruction, but seek to banish it as early as possible, considering it as a rude language, incapable of improvement, and which retards the expansion of the pupil's mind, and renders it less necessary for him to attend to written language. They adopt the methods of the early instructors, in waiting for occasions to teach words and explain phrases. They rely upon repeating the word or phrase in the appropriate circumstances, and in questions and answers, as the means of making it understood, rather than on direct explanation, or examples presented by the sign language. Too many of this school forget one of the fundamental maxims of Heinicke—'first ideas, then words'—and occupy the pupil for a long time with mere mechanical articulation. In one school months are passed in the mere study of names attached to pictures, without the least attempt to excite or enlighten the mind by means of signs; and usually a year is passed, at a period of life when most of the mental faculties are ripe for development, in the mere exercise of memory (in learning names of objects, and qualities, and actions), which only requires the powers of an infant, and would be aided, instead of retarded, by the expansion of the mind, as the experience of the other schools fully proves. Religious instruction is rarely attempted in this school before the second year, or until it can be given in words, from the belief that it cannot be given correctly by signs; and in the school of Leipzig it is even deferred to the third year. The attention of De l'Epée, and other instructors of

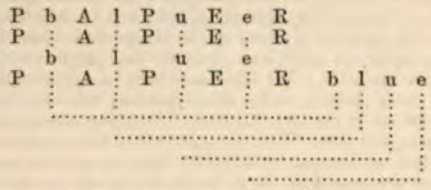
the same views, was called especially to the intellectual and moral wants of the deaf mute; and they deemed it most important first to develop his powers and cultivate his feelings; and, next, to give him such a knowledge of written language as is indispensable to the acquisition of knowledge and the communication of his wants. They found the only medium of conveying truth or explaining terms in the sign language which we have described. They employed it in its natural state, to explain the first simple terms. They discovered that it was capable of extension, and they preserved and cultivated it, as we have mentioned, as a language intelligible to the pupil, by which they could always refer to any objects of thought or feeling, physical, intellectual, or moral, and thus form original explanations of new words, and avoid the error which might arise from the imperfection of previous explanations. Words they considered as arbitrary signs, and De l'Epée maintained, that the instruction of the deaf mute, like that of a foreigner, ought to consist in a course of translation and retranslation from the known to the unknown language. To aid in this process, he added a series of methodical and conventional signs, founded on analogy, for the particles and inflections of language. These were used chiefly in instruction, in order to render the translation complete, as well as to indicate the character and meaning of the connectives. He does not appear to have practised fully upon his own principles, but occupied himself too exclusively with the intellectual improvements of his pupils, and with single words, and seems to have despaired of enabling them to use language, in its connection, except in a mechanical manner. Sicard endeavoured to complete the plan of his master by the improvement of the signs employed; and to him and his pupils we owe, more than to any others, the perfection which this language has attained. He also endeavoured to avoid the error of De l'Epée by explaining the theory of grammar, and the formulas of the various species of propositions, and in this way was led into a course of metaphysical and philosophical lessons, which later instructors have found too extensive and too little practical. According to the system adopted under his direction, the first year was occupied with a vocabulary of names, of adjectives, and of verbs, in three simple tenses, with simple religious and other narratives in the sign language. It was only in the second year that words were shown in their connection, in short phrases; the pronouns, prepositions, and the full inflection of the verbs were taught, and religious instruction given, in written language. In the third and fourth years the organs, senses, and operations of the mind, and theory of sentences were explained, original description and definitions required, and in the fourth year books were put into the hands of the pupils. Throughout the course public lectures were given, in which written accounts of Bible history and religious truth were explained in the sign language; but no devotional exercises in this language were ever connected with them or practised by the pupils.

British System.—The method of teaching which has been most successfully employed in this country is nearly the same with that employed by Sicard in France. It consists in teaching the pupil the relation between the names of objects and the objects themselves, the analysis of words into the letters of the alphabet, and the particular gesture which he is to attach to each word as its distinctive sign—showing to him also the meaning of collective words, as distinguished from those denoting individual objects, or parts of objects. General terms, as applicable in common to a number of individuals, and generic names comprehending a number of species, are next to be explained; and lastly, the most general and abstract terms, such as *being*, *object*, &c. The qualities expressive of the accidents, variations, and modifications of objects, and which are expressed by adjectives, are next taught. The master must endeavour to make his pupil conceive these qualities in the first place as inherent in the objects themselves, and next as capable of being detached by a mental operation from such objects, though in fact they have no existence but as united with them. The first and most important operation in instructing the child is, that written words have a meaning, and suggest to all persons of education the same definite idea; and in teaching him the meaning of words we should follow, as nearly as possible, the natural order in which they are generally acquired by those who have the sense of hearing. The first and simplest course of knowledge being that which relates to the objects composing the material world, we must commence of course by instructing him in the names of external objects, beginning with those which are best known to him, and most frequently presented to his view. The name of any object of this kind, such as a *knife*, may be written in large letters on a board; and the attention of the child being directed alternately to the name and to the object itself, which is to be presented to him at the same time, he will gradually be brought to understand that a certain relation exists between them, though what that relation is we are not to expect that he will as yet be able to comprehend. The idea of this relation, however, will become gradually more distinct when a similar process has been followed with regard to several other names. Occasionally we may find it difficult to convey by this means the least notion that the one is the sign of the other: the child being unable to conceive how what appears to him to be an irregular collection of crooked lines, bearing no resemblance in form to the object pointed out in connection with them, can serve as its type. Experience, however, derived from the observations we may teach him to make, will gradually instruct him. Sufficient having been done to excite his attention, let us now, in his presence, call upon other children more advanced in their education to direct their eyes upon these mysterious characters, of which the immediate consequences will be their pointing to the object itself. The effect produced will be observed by the attentive pupil, and will not fail to make its due impression. Let three or four words be now written at the same time upon the slate, and the corresponding objects placed upon an adjoining board; on each of these words being pointed out to the advanced child, he will bring the proper article from the table. We shall now have an opportunity of ascertaining how far the proceeding has been understood by the younger pupil by making him repeat the experiment. If he lay hold of the proper object, it is clear that our meaning has been understood, and that the first step, the most difficult of all, has been made. In this way he should be made to learn the names of various articles, preferring always those of a few letters, such as box, pen, shoe, cap, ring, hoop, key, &c. The child also, while learning written words, should be made to copy them himself, so that by dwelling on their forms sufficiently, they may make an indelible impression upon his mind. We should from time to time show him the objects, and require him to write their names himself. Here, too, it is obvious, that much assistance may occasionally be derived from drawings of the objects we may wish to point out, but which may not be immediately at hand. Thus the outline of any familiar object, such as a key, may be traced on a black board with a chalk pencil, and the object itself placed at the same time before the eye of the pupil, and thus he will

readily understand the resemblance of the design with what it is meant to represent; and the same operation is to be repeated in succession with other familiar objects. Then the name of each object is to be written within the outline of the figure drawn on the board; and the outline itself is to be effaced, and the pupil made to understand that he is still to consider what remains as denoting the object drawn; and that the writing and drawing stand for the same thing. When by this method the pupil has been once rendered thoroughly sensible of the value and use of words, all drawings on the slate are to be laid aside, and the more useful medium of written language exclusively resorted to. The method contrived by the Abbé Sicard for assisting his pupils to understand abstract conceptions is as follows:—Taking seven pieces of paper, each white on one side and coloured on the other with one of the primitive colours, he places them on a table, before a black board, with their white sides uppermost. He then writes the word PAPER on the board, leaving sufficient intervals between the letters for the insertion of other letters. Then turning the sheet of paper painted blue, so that the coloured side is now uppermost, he writes the word BLUE between the letters of the former word, but in smaller characters, thus—

P b A l P u E e R

This is done successively with regard to the other sheets of paper, inserting the name of its respective colour between the letters of the word PAPER, which is repeated for that purpose. On being finished, the blue sheet is again turned down, so that its white side is presented, upon which the smaller letters composing the word *blue* are effaced, while the other letters, P A P E R, are allowed to remain. By this process the pupil is taught to consider the quality as part of the object, or as inherent in it. In the same way he proceeds with other adjectives, such as *circular, spherical*, &c., expressing the form of objects; writing them in the intervals of the letters composing the name of the respective objects, effacing them and substituting others according as the form of the object is varied. In order to lead his pupil to form the abstraction of the quality thus expressed, that is, to the use of the adjective as a separate word ready to be applied to different substantives, he employs the following diagram, the different lines of which he traces before his eyes:—



The words thus obtained he afterwards unites by a connecting line, thus:—

PAPER—BLUE.

In order to form this into a complete sentence, the word *is*, instead of the line, is inserted, of which line accordingly it may be regarded as the substitute and representation:

PAPER IS BLUE.

By thus indicating the nature of a verb, and afterwards teaching the pupils that the verb can express either an existence or an action, past, present, or future, the teacher leads them to the system of conjugation, and to all the shades of tenses adopted in various languages. The significations and inflections of pronouns, with the corresponding affections of verbs in regard to number and person, are conveyed to the minds of the deaf and dumb by contrivances very analogous to the preceding, and which need not be dwelt upon, after the example already given.

As soon as the pupil is made familiar with the use of letters, it will be advantageous to instruct him in another mode of visible communication, very easy to be acquired, namely, the manual alphabet, as it is called; that is, the expression of letters by different positions of the fingers. This is a very simple art, commonly learned at school, and is easily retained or recovered when lost. There is another mode of intercourse still quicker in its operation, and which it may be very convenient to employ. It is that of indicating the forms of letters by the point of the finger moved in the air, constituting as it were an aerial writing which by a little use is quickly followed by the eye.

Another important branch of the education of the deaf and dumb is that of teaching them to speak, and to understand what is spoken by others, by observing the motions of their lips. Experience has shown that this task, though laborious and tedious, is not attended with extreme difficulty, great patience and perseverance being all that is requisite to ensure success in ordinary cases. But for all the details on this head we beg to refer our readers to the book of Dr. Joseph Watson on the Instruction of the Deaf and Dumb, published in London, 1809, in two volumes, 8vo. Dr. Watson had the management of the asylum for educating the deaf and dumb children of the poor, established at Bermondsey in 1792, as already mentioned. A rule was adopted in this institution that no child be admitted there under the age of nine years. This age was not fixed upon from an idea that it was the earliest at which their regular education could be advantageously begun. But *five* years being deemed, generally speaking, sufficient to accomplish that course of instruction thought most essential to such children destined to earn their bread by the labour of their hands, and fourteen being the earliest age at which they could be apprenticed, it was judged best for the economical purpose of the institution, not to receive them before the age of nine years. An institution of a similar kind was established at Birmingham, to which Mr. T. Braidwood, who conducted the school at Hackney already mentioned, was appointed teacher, and a liberal subscription having been raised, a building for the reception of children was completed and opened in January, 1815.

In the Edinburgh institution, established in 1810, and first taught by Mr. J. Braidwood, the pupils are all instructed in reading, writing, and arithmetic, and carefully taught the principles of the Christian religion. They are also taught to express their wants and ideas in articulate speech; the female pupils are taught needle-work, and those of an inferior station are qualified for domestic service. A number of the boys are brought up in the institution to shoemaking or other trades. This institution is supported by private subscription and by the aids furnished by auxiliary societies in other parts of Scotland. The charge for each pupil for education and board is about £20. Deaf mutes are also received for instruction at Donaldson's Hospital, Edinburgh.

American System.—As the American system of instruction, devised by Mr. Gallaudet, without any knowledge of others, except that of Paris, on which it is founded, comprises most of the improvements introduced into the Paris school, with some others of great importance peculiar to itself, we cannot

do better, within the limits allowed us, than to describe this as we have found it, in his own statement, and in the American asylum. Mr. Gallaudet has combined the fundamental principle of Heinicke — 'first ideas, then words' — with that of De l'Epée—that 'the natural language of signs must be elevated to as high a degree of excellence as possible, in order to serve as the medium for giving the ideas clearly, and explaining them accurately.' He has added another of no small importance—that, as words describe rather the impression or states of mind produced by external objects, than those essential qualities which are beyond our reach, the process of learning them would be facilitated by leading the pupils to reflect on their own sensations and ideas; and he states, as the result of his experience, that, among deaf mutes of equal capacities, 'those who can be led to mark or describe with the greatest precision the operations of their own mind, uniformly make the most rapid progress in the acquisition of written language and of religious truth.' A leading object, therefore, in connection with the first lessons, in which sensible ideas are presented and named, is to establish a free communication with the pupil, in the sign language, in reference to his feelings and thoughts, as excited by the objects which he sees, or the events of his own life. He easily comprehends those of others, and is thus led to learn the names of the simple emotions and acts of the mind. Hence he is brought to think of an invisible agent, which we term the *soul*, as the feeling and percipient being; and, by a natural transition, is led, by the use of signs alone, to the Great Spirit as the first Cause; to his character as our Creator and Benefactor; and to a knowledge of his law and our future destiny. In this manner the deaf mutes in the American asylum (and, we presume, in others derived from it) are made acquainted with the simple truths of religion and morality in one year; a period in which, in most European institutions, they are scarcely advanced beyond the knowledge of sounds, and the names of sensible objects, qualities, and actions, or the most common phrases. By communicating this instruction in the natural sign language, pupils, whose inferior capacity or advanced age would not allow them to acquire enough of written language to receive religious truth through this medium, have been early prepared to enjoy its blessings and hopes, and feel its sanctions as a restraint upon their conduct, which renders their government more easy, while it aids them in the formation of correct habits. Another plan, which is not known to have been ever employed before its introduction by Mr. Gallaudet in 1817, was to conduct the daily and weekly devotional exercises by signs; and the deaf mutes have been thus taught to address their Creator in their own natural language, and have been admitted to the new privilege of social worship. In applying the first principles to the course of instruction in language, an important improvement has been made by combining words into phrases as early as possible, and thus teaching the pupil how to use them. The idea of each phrase is first explained by the sign language, and then translated into words, and then retranslated by the pupil into his own language. The process is carried on for more difficult words, and the phrases are lengthened until they become narratives. The acquisition and use of the connectives are aided by the methodical signs of De l'Epée and Sicard. The pupil is called upon at intervals to express his own ideas in writing, and to explain by signs what is written by others. An important additional improvement is 'to employ the pupil, as early as possible, in the study of books written in an easy style, explained by signs when necessary,' so as to lead him by his own, and often by his unaided efforts, to become acquainted with the arrangement of words, and the idioms of written language. He is led gradually to infer the rules of grammar from a series of examples, instead of committing them to memory; and the theory of language is reserved for the later years of instruction, when the pupil is familiar with its practical use. The methods of instruction in the elements of arithmetic, geography, and history, do not differ materially from those usually employed, except that much aid is derived from explanatory signs; and experiments made in some of the schools of Europe prove that these may be usefully employed to illustrate various subjects to persons possessed of hearing.

Articulation.—While the instructors of the school of De l'Epée and Sicard unite in denying that articulation is necessary to the deaf mute as a means of mental development, they admit its great value as a supplement to intellectual education, if it be attainable. But they differ as to the practicability and expediency of attempting to teach it generally. Of its great practical value in darkness or in cases of sudden danger there can be but one opinion; and it is certainly important that every deaf mute should be taught some cry of distress, or perhaps a few words for such occasions: for some do not know how to use their voice even to this extent. The power of articulating, even imperfectly, may also be of great importance to the deaf mute, where ignorance in writing is combined with a phlegmatic inattention to signs, in those among whom he is situated. But that it is not indispensable, as an ordinary means of communication, is proved by the fact that the pupils of the French and American schools find no difficulty in making themselves intelligible to those around them, either by writing or signs, on all necessary subjects. Articulation is learned and recollected by the deaf mute as a set of movements and sensations in the organs of speech. It is taught by pointing out to the pupil the powers of the vowels and consonants, and the position of the lips, teeth, and tongue, and by making him feel with his hand, or a silver instrument, all the perceptible movements and vibrations of the throat and interior organs which are requisite for their pronunciation. He is then required to imitate this position, and to force a quantity of air from the lungs sufficient to produce the sound, and is taught to read the articulations of others, by observing the position of the organs and the countenance. The facility of doing this will depend much upon the pliability of the organ of speech, and the nature of the language to be learned. We observed, as would naturally be supposed, that the soft and regular language of Italy, in a climate where we have other evidence of a superior pliancy in the vocal powers, was acquired, with tolerable success, by a short period of daily practice. But the harsh and guttural sounds of the northern languages, and the irregularity which is found in the pronunciation of some of them, present several additional difficulties, which are perhaps increased by the frequent diseases of the vocal organs produced by a cold climate. Those instructors who attempt to teach all their pupils these languages are usually compelled to make it a constant and individual exercise, and to make and to demand efforts painful to the teacher, and pupil, and spectator, with only a partial success. Of a number of speakers, whom we have seen and heard of, in various countries, thus taught, few would have been intelligible to a stranger so readily as by signs; and their tones were extremely disagreeable. On the other hand, we have seen a few deaf mutes who are capable of speaking in a manner perfectly intelligible, and of reading, from the lips and countenance, what was said by others. They were such, however, as either retained

some remnant of hearing, or had been the subjects of individual instructions for a series of years. We presume the truth lies in that middle course now adopted by the school of Paris, and by some advocates of articulation who have had an opportunity of observing it in all its forms. They believe that, by that portion of the pupils of every institution whose organs are pliable, and who have some remnant of sensibility, either in the external or internal ear (those termed *demi sourds* in the Paris school), the acquisition may be made with a degree of ease and perfection which renders it a desirable and important branch of instruction for such portion of the pupils in every institution. They are equally convinced that to attempt to teach articulation to those entirely destitute of sensibility in the ear, or who cannot exercise the organ of speech without difficulty or pain, is a useless labour, and may produce disease in the pupil, as more than one instance proves. On the last point some have maintained that the exercise of the lungs is important to the pupil, while others have declared the contrary. We believe here, also, much will depend on individual organization, and that the general question will be modified much by the climate and nature of the language to be taught. Most of the schools for deaf mutes employ a manual alphabet, for the more rapid communication in words; —in England, usually made with both hands, and elsewhere with one. This alphabet, with writing, on paper and in the air, and the use of natural and conventional signs, are found adequate means of communication for those who cannot acquire articulate language. See Morel's Annales de l'Instruction des Sourds Muets et des Aveugles (Paris, 1844); and Dr. A. Blanchet's Deaf Dumbness treated Philosophically and Medically (London, 1851).

DEAL, a seaport, England, county Kent, between the North and South Foreland, and on the South-eastern Railway, 72 miles E. by S. of London. It consists of Upper and Lower Deal; the latter consisting of three streets parallel to the shore, and containing the bulk of the population, and the former of detached houses occupied chiefly by the wealthier classes. There is a large navy-yard, including an extensive naval storehouse, occupying part of the site of Deal Castle, which was built by Henry VIII. Boat-building and sail-making are the most important manufactures. Deal is a great pilot station, and the boatmen have long been celebrated for their skill and intrepidity in the numerous shipwrecks which take place on the Goodwin Sands. There is no proper harbour; but the well-known Downs afford excellent anchorage. There is a pier 1000 feet in length, which was opened in 1864. Pop. (1871), 8009.

DEAN, a corruption from *decanus*, Latin, from *decem*, ten, and meaning properly a chief over ten. This word, however, has acquired a much more extended meaning. Dean is, in England, a dignitary in most cathedral and collegiate churches, being usually the president of the chapter, which is supposed to consist of at least ten canons or prebendaries, and forms, with the dean, a council to advise the bishop in the affairs of the see. *Rural deans* were formerly beneficed clergymen appointed by the bishop to exercise jurisdiction in remote districts of the diocese. This office had fallen into disuse, being superseded by the appointment of archdeacons, but it has recently been revived. There are also a few deans called *deans in peculiar*, who exercise an independent jurisdiction, and are not under a bishop. Deans of colleges are, in English universities, officers appointed to superintend the behaviour of the members, and to enforce discipline. The French corruption of *decanus* is *doyen*, which has both a civil and an ecclesiastical meaning. The civil meaning is the most ancient member of a body or corporation. The *doyen* hence comes to signify a president, who may be appointed, as the *doyen de la faculté des lettres, de médecine*, &c. Ecclesiastically, *doyen* has the same signification as dean. In Scotland the term dean is used for civil offices, according to a usage somewhat similar to that of France. Thus we have the Dean of Faculty of Advocates, the Dean of Guild, &c. In Germany the head of each of the faculties of law, theology, medicine, and philosophy, in the universities, is called *decanus*, and is changed, like the rector of the university, annually.

DEAN FOREST, England, county Gloucester, 5 miles S.W. Newnham, formerly comprised the greater part of the county west of the Severn, but is now reduced to 22,000 acres, about a half of which is inclosed for the growth of navy timber. It is the property of the crown, and its inhabitants, besides being exempted from county rates, enjoy other ancient privileges. It is divided into six extra-parochial districts, called Denby-walk, Herbert's-walk, Little Dean-walk, Speech House-walk, York-walk, and Worcester-walk. It contains extensive plantations of oak and beech, and from the numerous orchards cider of excellent quality is produced. The inhabitants are principally employed in the iron and coal mines with which the forest and neighbourhood abound. The forest is intersected by numerous railways, communicating between the various mines and the rivers Severn and Wye.

DEATH, in common language, is opposed to *life*, and considered as the cessation of it. Strictly speaking, we can trace only the cessation of organic life. The matter of which the body is composed does not perish on the death of an organized being; it undergoes various changes, which are known by the names of *decay* and *putrefaction*, and which are the preparation for its becoming subservient to new forms of life. What becomes of the mind, or thinking principle, whether in man or animal, after death, is a matter of philosophical conjecture or religious faith. The investigations of science do not throw the least light upon it. The change here adverted to, which is called *death*, does not take place so quickly as is generally believed. It is usually preceded and caused by disease or the natural decay of old age. The state called death takes place suddenly only when the heart or the brain is injured in certain parts. Probably the brain and the heart are the parts from which, properly speaking, death proceeds; but as the cessation of their functions is not so obvious as the cessation of the breath, which depends on them, the latter event is generally considered as indicating the moment when death takes place. In the organs of sense and motion the consequences of death first become apparent; the muscles become stiff; coldness and paleness spread over the whole body; the eye loses its brightness, the flesh its elasticity; yet it is not perfectly safe to conclude, from these circumstances, that death has taken place in any given case, because experience shows that there may be a state of the body in which all these circumstances may concur without the extinction of the vital spark. This state is called *asphyxia*. The commencement of putrefaction, in ordinary cases, affords the first certain evidence of death. This begins in the bowels and genitals, which swell, become soft and loose, and change colour; the skin also begins to change, and becomes red in various places; blisters show themselves; the blood becomes more fluid, and discharges itself from the mouth, nose, eyes, ears, and anus. By degrees, also, the other parts are decomposed, and, last of all, the teeth and bones. In the beginning of decomposition nitrogen and ammonia are produced; in the progress of it, hydrogen, compounded with carbon,

sulphur, and phosphorus, is the prevailing product, which causes an offensive smell, and the light which is sometimes observed about putrefying bodies. At last, only carbonic acid gas is produced, and the putrefying body then smells like earth newly dug. A fat, greasy earth remains, and a slimy soap-like substance, which mixes with the ground, and contributes with the preceding decompositions to the fertility of it. Even in these remains of organized existence organic life is not entirely extinct; and they contribute to produce new vegetable and animal structures. Putrefaction is much influenced by external circumstances, particularly air, heat, and water. When the body is protected from the action of such agents it changes into *adipocere* (which see); but this process requires a much longer time than common putrefaction. In very dry situations the body is converted into a mummy, in which state bodies are found in the arid deserts of Africa, and on the mountains in Peru. Some vaults are remarkable for preserving corpses from putrefaction. It is well known to every reader that particular substances counteract putrefaction; for instance, those used in tanning, and in embalming mummies.

The *death-agony* is the state which immediately precedes death, and in which life and death are considered as struggling with each other. This state differs according to the cause producing it. Sometimes it is a complete exhaustion; sometimes a violent struggle, and very irregular activity, which at last, after a short pause, terminates in death. In some cases consciousness is extinguished long before death arrives; in other cases it continues during the whole period, and terminates only with life. The person in this condition has already somewhat the appearance of a corpse: the face is pale and sallow, the eyes are sunken, the skin of the forehead is tense, the nose pointed and white, the ears are relaxed, and the temples fallen in; a clammy sweat covers the forehead and the extremities, the alvine discharges and that of the urine take place involuntarily, the respiration becomes rattling, interrupted, and at length ceases entirely. At this moment death is considered to take place. This state is of very different length; sometimes continuing for minutes only, sometimes for days. When the patient is in this condition nothing should be attempted but to comfort and soothe him by prayer, by consoling assurances, by directing his attention to his speedy union with departed friends, to the life and immortality which the gospel has brought to light, and to the free salvation tendered to all, whatever their past lives may have been; but a dying fellow-creature should not be disturbed in relation to his particular mode of belief, at a moment when he has hardly sufficient strength to collect all the ideas which have been long familiar to him. As long as the dying person is able to swallow, wine or other cordials may be given from time to time. After death it not unfrequently happens that the countenance regains its most natural expression, and the saying is common—'How natural, how like himself!' The mind seems for a moment to have regained its influence over what it has so long informed, and to shed over the countenance its most beautiful light, to cheer the hearts of the friends who have witnessed the distortion of death, and afford an earnest of its own immortality.

DEATH, in mythology. The representation of death, among nations in their earlier stages, depends upon the ideas which they form of the state of man after this life, and of the disposition of their gods towards mankind. In this respect the study of these representations is very interesting. Of later ages the same cannot be said, because imitations of representations previously adopted are very often the subjects of the plastic arts in such periods. However, these representations do not altogether depend on the causes above mentioned, as the general disposition of a nation (for instance, that of the Greeks, who beautified every object) has also a great influence upon them; and it is remarkable that the Greeks, whose conceptions of an after-life were so gloomy, represented death as a pleasing, gentle being, a beautiful youth; whilst the Christians, whose religion teaches them to consider death as a release from bondage, a change from misery to happiness, give him the most frightful, and even disgusting shape. One reason of this may be that the call to repentance is a prominent feature in the Christian religion; and to arm death with terrors may have been supposed to give weight to the summons.

The Greeks personified death under the name *Thanatos*, while the *Kēres* were rather the goddesses of fate and violent deaths, like the Valkyriæ in the northern mythology. According to Homer, Sleep and Death are twins, and Hesiod calls them the sons of Night. They are often portrayed together on cameos, &c. During the most flourishing period of the arts Death was represented on tombs as a friendly genius with an inverted torch, and holding a wreath in his hand; or as a sleeping child, winged, with an inverted torch resting on his wreath. Sleep was represented in the same manner, except that the torch and the wreath were omitted. According to an idea originating in the East, death in the bloom of youth was attributed to the attachment of some particular deity, who snatched his favourite to a better world. It was ascribed, for instance, to Jupiter, or to his eagle, if the death was occasioned by lightning; to the water nymphs, if the individual was drowned, as in the case of Hylas; to Eos or Aurora, if the death happened in the morning; to Selene, if at night, &c. These representations were more adapted to relieve the minds of surviving friends than the pictures of horror drawn by later poets and artists. (See Herder's Wie die Alten den Tod gebildet.) Euripides, in his Alcestis, even introduced Death on the stage, in a black robe, with a steel instrument in his hand, to cut off the hair of his victims, and thus devote them to the infernal gods. The later Roman poets represent Death under more horrible forms, gnashing his teeth, and marking his victims with bloody nails, a monster overshadowing whole fields of battle. The Hebrews, likewise, had a fearful angel of death, called *Samaël*, and *prince of the world*, and coinciding with the devil; but he removes with a kiss those who die in early youth. The disgusting representations of Death common among Christians originated in the fourteenth century; for the representation of Death as a skeleton merely covered with skin, on the monument at Cumæ, was only an exception to the figure commonly ascribed to him among the ancients. In recent times Death has again been represented as a beautiful youth—certainly a more Christian image than the skeleton with the scythe. The monument made by Canova, which George IV. erected in honour of the Stuarts in St. Peter's church at Rome, represents Death as a beautiful youth. He is sometimes portrayed under the figure of a dying lion.

DEATH, Apparent. See Drowning.

DEATH, Civil, was the entire loss or forfeiture of civil rights, which followed on attainture for treason or felony. Formerly a man was considered civilly dead who retired into a monastery or abjured the realm. By Act 33 and 34 Vict. cap. xxiii. a conviction for treason or felony no longer causes attainder or forfeiture.

DEATH, Dance of, a grotesque allegorical representation in which the figure of Death under various forms takes the lead, followed by dancers of all ages

and conditions. It was frequently drawn by artists of the middle ages for cemeteries and cloisters. These representations were common in Germany, and also in France, where they received the name of *Danse Macabre*. This term is supposed by some to be derived from the Arabic *maghbarah*, a cemetery, but much more probably from the *Chorea Machabœorum*, or dance of the Maccabees, a kind of dramatic representation performed in the middle ages, in which the seven martyred brothers mentioned in the second book of Maccabees (Apocrypha) would appear to have been introduced. A Dance of Death was painted on the walls of the churchyard of the Innocents at Paris, about the middle of the fifteenth century, which the chapter of St. Paul's in London caused to be copied, to adorn the walls of its monastery. Gabriel Peignot, in the Recherches sur les Danses des Morts et sur l'Origine des Cartes à jouer (Dijon and Paris, 1826), investigated the origin of the Dance of Death in France, and explained the dancing positions of the skeletons, by the fact which old chronicles relate, that those who were attacked by the plague ran from their houses, making violent efforts to restore their rapidly declining strength by all kinds of morbid movements. The most remarkable Dance of Death was painted, in fresco, on the walls of the churchyard in the suburb of St. John at Basel, which was injured, in early times, by being washed over, and is now entirely destroyed. This piece has been ascribed to the celebrated Hans Holbein; but it has long since been proved that it existed sixty years before his birth. It was painted at Basel in the year 1431, by an unknown artist, in commemoration of the plague, which prevailed there at that time; the council was then sitting, and several of its members were carried off by it. It represented Death as summoning to the dance persons of all ranks, from the pope and the emperor down to the beggar, which was explained by edifying rhymes. That piece contained about sixty figures as large as life. Besides being ascribed to Holbein, as was before stated, it has also been ascribed to a painter named Glauber, but without foundation. Holbein perhaps conceived, from this picture, the idea of his Dance of Death, the original drawings of which are in the cabinet of the Empress Catharine II. of Russia. Some say that Holbein himself made the wood-cuts of it. Very fine engravings of this work of Holbein are in thirty-three plates, in the Œuvres de Jean Holbein, par Chr. de Meckel (1st vol., Basel, 1780). Similar representations were painted, in the fifteenth century, in other cities of Switzerland. The Dance of Death in St. Mary's church at Lübeck was completed in 1463. On the walls of the churchyard of the Neustädt of Dresden, there is, even at the present time, to be seen a similar Dance of Death. It consists of twenty-seven bass-relief figures, cut on sandstone, and includes persons of both sexes, and of all ranks. The labour of the sculptor has more merit than the unpoetical rhymes which were afterwards added.

DEATH'S-HEAD MOTH (*Acherontia Atropos*), an insect of the order Lepidoptera, the largest species of hawk-moth. It presents on the black ground of the upper surface of the thorax a rude delineation of a human skull marked out in light yellow, which makes it an object of superstitious awe to the peasantry of England. Its front wings are of a blackish-brown colour, with irregular light bands of brown and gray above and below, and a well-defined white dot in the middle. The hind wings are yellow, and have two black bands, of which the lower is the broader. The abdomen is covered with alternate yellow and black bands, with a dark longitudinal band along the middle. It flies after sunset, and utters an audible cry when disturbed. It robs beehives of their honey, and its skin is so thick as to be impervious to the sting of the bees, which have been known when it abounded to close up the principal entrance to their hive as the only means of escaping its depredations. The caterpillar attains 4½ inches in length. Its colour is yellow, with black dots and bands of blue, variegated with violet and white. It lives chiefly on the potato.

DEATH-WATCH, the popular name of the *Anobium*, a genus of coleopterous insects that inhabit the wood-work of houses, and in calling to one another make a peculiar ticking sound, which superstition has interpreted as a forerunner of death.

DEBENTURE, a deed-poll (declaratory deed) charging certain property with the repayment of a loan, together with interest thereon. Debentures are frequently issued by railway and other public companies for the purpose of borrowing money. To be valid they must be in act of Parliament or deed of settlement of the company. The issue of debenture stock is regulated by the Companies' Clauses Act, 1863 (26 and 27 Vict. cap. cxviii.) Railway debentures are usually accompanied by separate warrants called *coupons* for the payment of the interest. Both debentures and coupons are transferable.

Debenture is also a certificate given by the officers of customs to entitle a merchant to bounty or drawback on goods exported.

Debentures charged on land in Ireland may be issued by permission of the Landed Estates Court.

DEBRECZIN, a town of Hungary, in the comitat of Bihar, on the edge of the great central plain of Hungary, 113 miles E. of Pesth; pop. 46,111. Like many other Hungarian towns it looks more like a collection of villages than a single town. Its houses are mostly of a single story; and in wet weather the wide but unpaved streets become almost impassable from mud. The principal edifices are the Protestant church and college, with a library of 20,000 vols., the Piarist college, and gymnasium, several hospitals, and two infirmaries. Both the manufactures and trade are important; the former consisting chiefly of coarse woollens, leather, soap, tobacco-pipes, casks, &c., and the latter being in tobacco, wine, flax, hides, wool, potash, cattle, cheese, &c. There are four large fairs annually, and the swine market is the largest in the kingdom. Debreczin is considered the head-quarters of Hungarian Protestantism. The Protestant college, founded in 1792, is considered the best educational establishment in Hungary. This town suffered much in the wars between the Hungarians and the Turks, and afterwards in the religious wars.

DEBT, NATIONAL. See BRITAIN—Financial History.

DEBTOR AND CREDITOR, LAWS OF. One of the earliest institutions among men is the right of holding individual property. Upon this right depends the power of making bargains and effecting exchanges. In various ways, which will readily suggest themselves, bargain-making gives rise to deferred engagements, and obligations are incurred which are called debts. These obligations rest upon a double foundation. The right of holding individual property implies the right of recovering any property which has been intrusted to others, or of claiming possession of any property which others have, for a valuable consideration, agreed to make over to us. The primary foundation of debts, therefore, is the right of holding property. This right may be held more or less sacred in various states of society, and according as it is regarded as more or less inviolable, the obligation of a debt will be liable to rise or fall in general estimation. But this, though the primary, is not the only

foundation of the obligation implied in a debt. A debt is a contract freely entered into. Whether the right of property is valid or not, it is commonly recognized by the person who incurs debt. If he has incurred any previous wrong in the distribution of property, he condones it, as far as his creditor is concerned, in making this contract; no abstract doctrine of the rights of property, therefore, can properly come between him and his creditor to justify the violation of an engagement for which he has accepted an equivalent. Credit affords a means by which those who have no property of their own may acquire important advantages through the use of the property of others, and while proprietary rights are recognized, it is of great consequence to society that the obligations incurred in borrowing should be faithfully fulfilled. Without punctuality in the fulfilment of such obligations there would be no confidence. People who had property would not trust those without it, enterprise would decline, industry would be restricted, and society would suffer. Hence a very great practical importance is to be attached to the moral obligation implied in the contract of a debt, independently altogether of any abstract or theoretical views which may prevail as to the soundness of the particular institution of proprietary rights on which that obligation may be founded.

From the peculiar nature of this obligation, from the evils, so easily foreseen, which would ensue from lightly regarding it, and from the difficulties which may incidentally arise in the way of fulfilling it, society is placed in a position of peculiar difficulty and delicacy in providing by legislation for its enforcement, and is liable to two opposite errors in its treatment of it. In early and rude states of society the natural tendency is to regard all obligations as sacred and inviolable, and all who from any cause fail to fulfil them as criminal in act or intention, either by omission or commission, and liable to the most severe and exhaustive punitive treatment. In such a state of society both the primary and secondary foundations of the obligation are likely to be held in extreme estimation. No speculative doctrines on the rights of property are likely to exist; even if they chanced to arise, the tension to which in later times the rights of property are exposed would be wanting to give them force, and on the other hand, the possession of property is generally in rude societies combined with superior power, and associated with claims to authority which do not necessarily belong to the institution itself. The holders of property being the stronger portion of society, the estimation in which obligations in their favour are at first held is likewise great. The increasing difficulties which in the progress of society necessarily arise in the way of meeting such obligations are, in the absence of experience, certain to be underestimated, and the failure of a person of inferior estimation to fulfil his obligation to one of greater rank and importance in society is not likely to be treated as much, if at all, short of a crime. Hence in the earlier stages of society the laws against debtors are universally found to be of the most stringent kind, and as civilization advances, and the relations of society become more complicated, the necessity of repeated modifications of these severe laws becomes apparent. Experience demonstrates that in innumerable ways debtors may, without moral culpability, become unable to meet their engagements, and that to treat this incapacity as a moral delinquency, or even to pursue it with undeviating logical rigour, would disturb the order of society, and shake its most solid institutions to their very foundation. Finally, as the obligation of debt comes to be considered apart from all the prejudicial complications with which the earlier ideas and customs of society may have surrounded it, the theory of law regarding it attains in all civilized societies a uniform development. It is regarded as an obligation for which the property of the debtor alone is liable, and from which, when he ceases to have, or has surrendered his property, the interest of society demands that he should be set free. But this theory, though simple and equitable in itself, and putting an end to innumerable evils resulting from the over-stringency of the laws against debtors, is not without difficulty in its application, and opens the door to a new class of evils still more difficult to guard against. Any modification in favour of the debtor of the consequences of incurring debt, however equitable in itself, necessarily tends to increase the facility with which debt will be incurred, and if these consequences are over-relaxed society will be deprived of a needed protection; debt will be incurred carelessly, and as carelessness borders upon recklessness, and recklessness upon fraud, the lines of distinction between right and wrong dealing will become fainter, the protection due to misfortune, and the condonation necessary to be extended to miscalculation and errors of judgment will become a cover for deliberate conspiracy, and society will become a prey to an organized predatory system or modernized form of highway-robbery, thinly disguised under the forms of commerce. Such are the practical difficulties which the modern theory of the law of debtor and creditor has to encounter. The means which have been adopted in various countries of meeting them are explained to some extent in our article BANKRUPTCY; we shall here give a brief outline of facts illustrative of the progress of the law of debtor and creditor in various countries.

Among the Jews, under the Mosaic law, debt was treated with great stringency, but there were regulations adapted to discourage the incurring of it, and also some humane restrictions on the power of the creditor after it had been incurred. Lending on usury was forbidden, and the taking of pledges put under severe restriction. The alienation of the estate of an Israelite was also forbidden. The creditor, on the other hand, had power over the person of his debtor, and even over those of his wife and family, and could cause them to be sold in satisfaction of his claim. If the debtor was an alien he might be sold to perpetual bondage, but on the occasion of a jubilee, which was appointed to be proclaimed every fiftieth year, every Israelitish debtor was set free, and his property, if pledged or sold, returned to him.

Nothing is more common in rude states of society, and under arbitrary and despotic governments, than the liability of the person of the debtor for his debt. The possession of property in such states of society frequently gives the possessor an arbitrary power over the persons of those who are destitute of it, and when such persons come under an obligation to him, it is an easy thing to establish a claim to personal service. This is one of the original sources of slavery. Even in the comparatively enlightened states of Greece and Rome the power of the creditor over the person of his debtor was recognized by law. This power was abolished in Athens by Solon, who is said to have taken his reform from Egypt, where the same unjust law had already run its course. The early Roman law was even more excessive in its undiscriminating severity. By the law of the Twelve Tables the creditors might cut the body of the debtor in pieces and share it among them, they might also sell him and his wife and family to perpetual slavery. The former of these alternatives may probably be considered as only a theoretical representation of the absolute power of the creditors. Owing to the Roman military code and other circumstances, the number of debtors in Rome from an early period was

very great. They formed a powerful body in the state, and their complaints and grievances frequently threatened its overthrow. Hence the concessions made from time to time to their demands form an important chapter in Roman jurisprudence, and are one of the things which make it so rich a fund of instruction to all ages. In the middle ages, notwithstanding the influence of Christianity, the debtor was treated with hardly less severity. The creditor could put him in chains and feed him with bread and water until he paid the principal of his debt. Even the church took the side of the creditor, and the debtor who died without discharge was excommunicated and deprived of Christian burial. As society became more refined the laws against debtors were again gradually ameliorated, but the process was a slow one. Imprisonment for debt, except as an instrument for compelling the surrender of the debtors' effects, the last relic of personal liability, has only been put an end to in the present reign. Until 1861 a distinction was maintained between traders and non-traders. The former only could become bankrupt and obtain a discharge of their liabilities; the latter were called insolvents, and although the court took charge of the liquidation of their debts, and protected them under certain conditions, it gave them no discharge from their liabilities after their means were exhausted. De Foe, the author of Robinson Crusoe, who became bankrupt in 1692, complains bitterly of the severity of the law in his day, which, he says, is such that the honestest man in the kingdom would flee out of the kingdom rather than submit. It is a very difficult question to decide whether now, as many good authorities incline to believe, our law does not err on the side of leniency.

DEBURE, Guillaume and Guillaume François, two cousins, distinguished bibliographers. Guillaume was born at Paris in 1734, and died in 1820; Guillaume François was born in Paris in 1731, and died in 1782. Guillaume was at his death librarian to the Academy of Inscriptions. The former prepared the first division of the catalogue of the excellent library of the Duke de la Vallière (1783, two vols.) The libraries catalogued by him, some of them important, amount to forty-three. The latter opened a new path for bibliographers by reducing to a system what had before been left merely to tact, in his Bibliographie Instructive, ou Traité de la Connaissance des Livres rares et singuliers (Paris, 1763–68, seven vols.) Lemercier and others attacked the work severely; yet it must be considered of much value. (See Ebert's Bibliographisches Lexicon, vol. i. p. 452.) Among his other works is to be mentioned, Supplément à la Bibliographie Instructive, ou Catalogue des Livres du Cabinet de M. Gaignat (Paris, 1769, two vols.) To these two works, that of Née de la Rochelle, Table destinée à faciliter la Recherche des Livres Anonymes, &c. (1782), forms a tenth volume. The sons of Guillaume Debure, advantageously known in the world of letters as Debure Frères, have distinguished themselves as bibliographers by the catalogue of the rich and valuable library of Count MacCarthy Reagh (1817).—Jean François Debure-Saint-Fauxbin; born 1741; died 1825, brother of Guillaume François, gave up the profession of a bookseller, and became a distinguished classical scholar. He translated the Consolations of Boethius, and some of the works of Epictetus and Longus.

DECADE (Latin, *decas*, from the Greek *deca*) is sometimes used for the number ten, or for an aggregate of ten, and *decades* for an enumeration by tens. The books of Livy are divided into decades. In the French revolution, decades, each consisting of ten days, took the place of weeks in the division of the year. See Calendar.

DECAGON (*decagonum*), in geometry, a figure of ten sides and angles.

DECALOGUE (from *deca*, ten, and *logos*, the word), the ten commandments, which, according to Exod. xx. and Deut. v., were given by God to Moses on two tables. The Jews call them, by way of eminence, the *ten words;* hence their name *Decalogue*. Jews and Christians have divided the ten commandments differently; and in some Catholic catechisms the second commandment has been united, in an abridged form, with the first, and the tenth has been divided into two.

DECAMERON. See Boccaccio.

DECAMPS, Alexandre Gabriel, an eminent French painter, was born in Paris in March, 1803, and educated in the studio of Abel de Pujol. When a young man he made a journey to the East, and returned from thence with a collection of sketches, from which he afterwards produced some of his finest pictures. Among the more celebrated of these are The Grand Bazaar, Relieving Guard at Smyrna, a Turkish Café, Turkish Children going out of School, and Arab Horsemen Passing a Ford. Of pictures of another class may be mentioned, The Shepherd and his Flock overtaken by a Storm, An Italian Village, The Hawking Party, Spaniards Playing at Cards, and Don Quixote and Sancho Panza. Decamps has also produced some historical and sacred pictures of a high order of art, including the Defeat of the Cimbri; The Miraculous Draught of Fishes; Joseph Sold by his Brethren; The Finding of Moses; and others. The leading merits of this painter are great originality of conception and vigour of expression, with a wonderful skill in the treatment of light and shade. About sixty of his pictures were exhibited in the Paris Exhibition in 1855. He met his death in an unexpected and distressing manner. He had taken up his abode at Fontainebleau; and being a great lover of the chase, used frequently to join the hunting parties of the court. On one of these occasions his horse, a wild headstrong animal, ran suddenly off on the appearance of the hounds, and dashed his rider against the bough of a tree with such violence that he only survived for two hours. This melancholy event took place on 23d August, 1860.

DE CANDOLLE, Augustin Pyrame, one of the most illustrious of modern botanists, born at Geneva in 1778, early displayed decided literary tastes, and excelled particularly in writing French and Latin verses. He had determined to make literature his profession, when the siege of Geneva by the French, in 1792, obliged him, with his mother and brother, to take refuge in a village at the foot of the Jura. Till this time he had never opened a book on botany; but the volume of nature was now before him, and the amusement of collecting the wild plants around him awakened a new passion in his breast, and his botanical career was decided. On returning to Geneva he attended the lectures of Professor Vaucher, and in 1796 went to Paris, where he attended the lectures of Vauquelin, Cuvier, and Fourcroy, and also became intimate with Desfontaines and Lamarck. He returned to his native city and took an active part in the transactions of the Society of Physics and Natural History, which had been recently established under the auspices of the celebrated De Saussure; but again revisited Paris, studied medicine, and took his medical degree, taking as the subject of his thesis the medical properties of plants. This essay, which was afterwards republished in an enlarged form, displayed great ability, spread its author's fame, and even contributed to an important improvement in science, by attracting more general attention to the structure and secretions of plants. In 1804 he lectured in the College of France on vegetable physio-

logy; and the following year published an outline of his course, under the title of Principes de Botanique, prefixed to the third edition of Lamarck's Flore Française. In this outline he laid the basis of that system of classification which he afterwards developed more fully in larger and more celebrated works. In 1806 he was employed by the ministry of the interior to collect information on botany and the state of agriculture within the limits of the French Empire, and during each of the six following years made a long journey for the purpose, and drew up an annual report. In 1808 he obtained the chair of botany in the faculty of medicine at the University of Montpellier. He here paid particular attention to the botanical garden, more than doubled its extent, and published a catalogue of the plants, with descriptions of many new species. In 1816 he finally quitted Montpellier and returned to Geneva, where a chair of natural history was expressly created for him; and one of his first public benefits to his native city was the establishment of a botanical garden. The same year he visited Great Britain, and examined its most important collections of plants, with a view to the completion of his great work on the vegetable kingdom, which was now on the eve of publication. The first volume of this work, which was intended to comprehend a description of all known plants, appeared in 1818, and a second in 1821; but the design was too vast for the accomplishment of one individual. The number of known species, which amounted to 7000 in the time of Linnæus, was estimated by De Candolle at 25,000 in 1815, at 57,000 in 1817, and at 80,000 in 1840,—hence he abandoned his plan, to commence, in 1824, only a Prodromus of the larger work; but even this proved more than he was able to accomplish in his lifetime. In 1827 he published, under the title of Organographie Végétale, two vols. 8vo, one of his most valuable and scientific works, in which he traces each organ through all its modifications of structure in different plants, and reduces every part to its organic elements. He was vigorously prosecuting other important works when his health began visibly to decline. The consciousness of the fact, instead of inducing him to diminish or desist from his labours, only animated him to greater diligence, in the hope that death might spare him till his more important works were completed. He thus, unfortunately, only hastened the event. In 1841 he was induced to attend a meeting of naturalists at Turin, where it was thought that the change of climate might have a favourable effect; but he obtained no benefit, and had only returned to his native city when he was seized with a fatal illness, and died in the sixty-fourth year of his age. As a lecturer De Candolle was remarkably successful in creating among his students the same enthusiasm which glowed in his own breast; as a scientific botanist he stands almost unrivalled; and as a citizen and a man he deserves honourable mention for his many virtues, and the philanthropic institutions which he instituted or patronized.

DECANDRIA, in the Linnæan system of botany, the tenth class of plants, with hermaphrodite flowers, and ten stamens in each.

DECAPITATION. See Capital Punishment.

DECAPODA. See Crustacea.

DECAPOLIS, in ancient geography, a country of Palestine, which contained ten principal cities, some on one, some on the other side of Jordan, whence its name. Pliny enumerates the following:—Scythopolis, Philadelphia, Raphana, Gadara, Hippos, Dios, Pella, Galasa or Gerasa, Canatha, and Damascus. Others reckon them differently. They were chiefly inhabited by Gentiles, though some of them might be within the region of Judea.

DECARBONIZATION (of iron) is a process now frequently adopted, by means of which pig or cast iron is converted into steel or malleable iron, by being deprived of its superfluous carbon. The articles to be decarbonized are exposed to heat in contact with peroxide of iron. For this purpose they are usually packed in finely-powdered hæmatite, mixed with iron-filings. Cast-iron may also be decomposed during fusion by a current of air. In France and some parts of America steel is produced directly from rich iron ore in this way by means of the Catalan forge.

DECCAN [Sanskrit, *Dakshina*, the South], a term formerly applied to the whole of peninsular Hindustan south of the Nerbudda, and of a line drawn from the sources of that river east to the mouth of the Hooghly. It is now limited to the territory lying between the Nerbudda and the Kistna, or between the parallels of 16° and 23° N., and the Arabian Sea on the W. and the Bay of Bengal on the E.; greatest length, from east to west, 900 miles; greatest breadth, from north to south, 490 miles. It comprises the provinces Candeish, Gundwana, Orissa, Berar, the Northern Circars, Beeder, Aurungabad, Hyderabad, Bejapore, together with the dominions of the Nizam, the rajahs of Berar and Sattarah, the Guicowar and Gwalior sovereigns. What is known as the British Deccan comprises the collectorates of Candeish, Ahmednuggur, Poona, and Darwar, under the Presidency of Bombay; and the Balaghaut ceded districts on the Nerbudda, under the Presidency of Bengal.

DECEBALUS (Greek, *Dekebalos*), the name of several Dacian kings, or perhaps a general title of honour borne by them. One of them mentioned by Dion Cassius, and who by other historians is called Diurpaneus or Dorphaneus, distinguished himself by his opposition to the Roman arms during the reigns of Domitian and Trajan. In consequence of his military capacity the reigning sovereign, Douras, abdicated in his favour, and shortly afterwards he crossed the Danube, defeated and slew Appius Sabinus, governor of Mœsia, and, carrying his victorious arms far and wide, captured many important towns and fortresses. Domitian, A.D. 86, hastened to meet him, but gave the command to the prætorian prefect Cornelius Fusus, who soon proved his incompetency by a disastrous campaign, which cost him his life, and the loss of many prisoners, the loss of the baggage, and an eagle. The war ultimately proved so disastrous to the Romans that Domitian sued for peace on the most degrading terms, and stooped to promise the payment of an annual tribute. Trajan, shortly after his accession, was able to change the face of affairs, and Decebalus was obliged to appear in the emperor's presence, and submit to terms at his dictation. On this, Trajan returned to Rome in triumph, and assumed the surname of Dacicus. In 104 the war was renewed; but Trajan, having thrown a stone bridge over the Danube about 6 miles below the Iron Gates, succeeded, after a desperate resistance, in subjecting the whole country, and in converting it into a Roman province. Decebalus, to escape falling into the hands of the victors, committed suicide.

DECEM (Latin, ten), a word which is found in several compound and derivative words in English: as *December*, to *decimate*, *decimal* fractions, &c.

DECEMBER, the twelfth month of our year, from the Latin *decem*, ten, because in the Roman year instituted by Romulus it constituted the tenth month, the year beginning with March. In December the sun enters the tropic of Capricorn, and passes our winter solstice. This month was under the protection of Vesta.

DECEMVIRS. See Appius Claudius.

DECIDUOUS is a term applied in botany to various organs of plants, particularly leaves, to indi-

cate their annual fall. A tree of which the leaves fall annually is called a deciduous tree, and the same term is applied to the leaves themselves. When the calyx of a flower falls along with the corolla it is called deciduous; when it falls on the expansion of the flower it is called caducous. Most of the trees of this country are deciduous. In warm countries the leaves frequently remain for two or more years. These are called persistent. The plants called evergreens never lose all their leaves at once.

DECIMAL FRACTIONS. See FRACTION.

DECIMAL SYSTEM is the name given to any system of weights, measures, or money in which the unit, whatever it may be, is always multiplied by 10 or some power of 10 to give a higher denomination, and divided by 10 or a power of 10 for a lower denomination. The decimal system was introduced into France at the revolution in regard to weights, measures, and time. The old enumeration of time has been resumed, but the decimal system has been retained for all weights and measures as well as in the monetary system. To express the higher denominations, that is to say, the unit multiplied by 10, 100, 1000, 10,000, the French make use of the prefixes *déca*, *hecto*, *kilo*, *myria*, derived from the Greek; thus, the *mètre* being the unit of length, *décamètre* is 10 mètres, *hectomètre* 100 mètres, *kilomètre* 1000 mètres. To express lower denominations, that is, tenths, hundredths, &c., the Latin prefixes *déci*, *centi*, *milli* are used in the same way; thus a *centilitre* is the hundredth part of a *litre*, *décilitre* the tenth part of a *litre*. The French system is based on a theory of entire unity in the whole of the methods of enumeration. The basis of the whole system is the linear measure, the unit of which is the mètre, supposed to be the ten-millionth part of a quadrant of the earth's meridian. Upon this the metric system is founded directly, while the system of weights and measures is derived from it in the following manner:—

The square of 10 mètres, or square décamètre, called an *are*, is the unit of surface measure.

The cube of the tenth part of the mètre, or cubic décimètre, called a litre, is the unit of liquid capacity.

The cube of the mètre, called a *stère*, is the unit of solid measure.

The weight of a cubic centimètre of distilled water at 39°·2 Fahr. (4° Centigrade, called a gramme, is the unit of weight.

The mètre = 39·37079 inches English.
The are = 1076·441 square feet.
The litre = 1·7608 pints.
The stère = 35·317 cubic feet.
The gramme is 15·4323 grains.

The French unit of money is the *franc*, which is divided into *décimes* and *centimes*. Other states have followed the example of France in adapting their money, weights, and measures either partly or wholly to the decimal system, such as Belgium, Holland, Austria, Italy, Russia, the United States, and Canada. The only advance towards this system in England is the coining of the florin, the tenth of a pound.

DECIMATION, in war, the selection of the tenth man of a corps by lot for punishment, as in case of revolt. It was early practised by the Romans. Sometimes every tenth man is executed; sometimes only one man of each company, the tenth in order, as was the case when the Saxons revolted against Blücher before the battle of Waterloo.

DECIPHERING, ART OF, the art of discovering the contents of a writing in which secret characters are used (often ciphers, hence the term *deciphering*). First, the vowels must be determined. This is done in the following way:—1. All the words of two letters are selected and written down together; then those words are selected which are divided at the end of a line, so that only two letters of the word remain, one of which must necessarily be a vowel. Then the five (or whatever may be the number of the vowels in a language) letters are taken which occur the most frequently. 2. It is necessary to see if some one of these five letters is contained in every word of the secret writing. If there is any word in which none of them is contained, the signs of the vowels are not yet all discovered, and it remains to make the attempt again. When the vowels are found they must, 3, be distinguished from each other. For this purpose it should be determined which vowel occurs most frequently in the language in which the manuscript is supposed to be written. In every language particular rules for determining the vowels may be laid down. All the ordinary modes of deciphering fail in the case of those secret writings in which dictionaries are used as the basis, and whole words, and even short sentences, are denoted by single ciphers, and where also the order of the ciphers 1, 2, 3, &c., does not correspond to the alphabetical arrangement of the words in the dictionary, but is made as irregular as possible, and *non-valeurs*, as they are called, are made use of, that is, ciphers without signification, which are intermixed with the *valeurs*, or those ciphers which supply the place of words. The old modes of secret writing have been almost entirely superseded, and the old modes of deciphering have been made almost entirely useless by the modern species of cryptography, in which, according to a simple rule, which may be communicated verbally and retained in memory, the signs for the letters may be continually changed. See CRYPTOGRAPHY.

DECIUS, C. MESSIUS QUINTUS TRAJANUS, a Roman emperor, who reigned from A.D. 249 to A.D. 251. He persecuted the Christians, and perished, with his army in a bloody battle near Abricium against the Goths, through the treachery of Gallus who succeeded him as emperor.

DECIUS, JUBELLIUS, a Roman general, appointed to the command of the Campanian legion, which had been stationed at Rhegium for its protection B.C. 281. He shamefully abused his powers, and, under the pretext that the inhabitants were intending to betray the garrison to Pyrrhus, was guilty of the greatest atrocities. Shortly after, having been attacked by a disease in his eyes, he sent to Messana for a physician, who happened to be a native of Rhegium. The physician, determined to revenge the cruelties inflicted on his countrymen, prescribed an application, enjoining Decius to continue it, however painful it might be, till the physician again returned. The pain became insupportable, but the application had effected the purpose intended, and Decius found that his sight was destroyed. To complete his punishment, the Romans gave effect to the complaints of the citizens, and he perished by his own hands in a Roman prison.

DECIUS MUS, PUBLIUS, a Roman consul, who, in a war against the Latins B.C. 340, devoted himself to death for his country. His example was followed by his son, and, according to some historians, by his grandson. Such acts of self-devotion (*devotiones*) were not unusual at that time, when patriotism and piety exerted a powerful influence, and were performed with great solemnity. He who devoted himself, after performing certain religious rites, rushed into the midst of the enemy, clothed in splendid armour, to show his countrymen how a brave man ought to die for his country.

DECK. See SHIP.

DECKER, THOMAS. See DEKKER, THOMAS.

DECLARATION OF WAR, the formal notice which by the usage of nations belligerents are expected to give before commencing hostilities. When any advantage can be gained by neglecting it, this understanding is frequently violated.

DECLINATION, MAGNETIC. The magnetic north and south line, that is, the line which a magnetized needle, such as that of an ordinary mariner's compass, sets, only coincides with the astronomical north and south line in certain places on the earth's surface. The magnetic declination indicates the amount of the deviation of the magnetic from the true north and south line. It is of the highest importance to know the amount of the magnetic declination at every part of the earth's surface; for if it be known, the true north and south line can be determined by means of the compass. For this reason it is always exhibited by means of a diagram on nautical charts, and on maps which are to be used to indicate directions in travelling.

The magnetic declination at any place is defined in the following way:—Let a magnetic needle be arranged to swing freely in a horizontal plane at the place. A vertical plane containing the needle is called the plane of the *magnetic meridian* at the place: and the angle between the plane of the magnetic and the plain of the geographical meridian is the *magnetic declination* at the place. In England the angle is nearly 20° West at present. It varies from place to place. (See MAGNETISM, TERRESTRIAL.) It is undergoing gradual change, and it has also slight annual and diurnal variations.

DECLINATION OF THE SUN, OF A STAR, OR A PLANET, is its distance from the equinoctial, northward or southward. When the sun is in the equinoctial he has no declination, and enlightens half the globe from pole to pole. As he increases in north declination he gradually shines farther over the north pole, and leaves the south pole in darkness. In a similar manner, when he has south declination, he shines over the south pole, and leaves the north pole in darkness. 23° 28′ is the sun's greatest declination north or south.

DECLINOMETER, an instrument for determining the magnetic declination, and for observing its variations. In magnetic observatories there are permanent instruments of this kind, and they are now commonly made self-registering by photographic means. It is the object of such instruments to register the small hourly and annual variations in declination, and also the variations due to *magnetic storms* (which see). But the most common form of declinometer is that employed for determining the magnetic declination at various parts of the earth's surface, and thus making, with the assistance of the *inclinometer*, or instrument for determining the *magnetic inclination*, a magnetic survey of the earth.

As will be understood from the article DECLINATION (MAGNETIC), a portable instrument, to be complete, requires first an arrangement for determining the magnetic north and south line, and secondly an instrument for determining the line of astronomical north and south. The first is furnished in a magnetized needle, supported with great nicety on a vertical bearing. For this purpose a steel point is used on which a conical agate or ruby cup attached to the magnet rests, and the magnet is delicately balanced about this bearing. It swings over a *compass-card* accurately divided into degrees and quarters of a degree; the box that contains the needle and compass-card is supported on an upright pillar, round which, as a vertical axis, it turns; and the whole stand is carried on levelling screws.

The second part of the instrument, for determining the astronomical north and south line, is a telescope like a small transit instrument. It is borne on two vertical supports, which are fixed at diametrically opposite sides of the compass box, so that the horizontal axis round which the telescope turns crosses the card from the point marked 90° to that marked 270°; and the telescope itself turns in the vertical plane that passes through 0° and 180° when the instrument is levelled.

To observe with the declinometer, the true north and south line is determined either by observing the greatest altitude of the sun or by means of a known star, and the telescope pointing due north and south, the number on the compass-card to which the needle points, east or west of the zero, can be read off, and is the declination angle for the locality.

There is, however, an important matter to be attended to as a correction in determining the declination exactly. The magnetic axis of the needle does not always, or indeed ever, coincide with the axis of figure of the needle, and as it is the direction of the magnetic axis that is required an error would be committed by reading simply from the points of the needle. For this reason the needle is constructed so that it can be lifted from its point of support and turned over, the lower side being uppermost at a second reading. The mean of two readings thus taken should be the true declination. But it is usual, also, in order to get rid of any error of centering, to read at *both ends* of the needle. Thus, in fact, four numbers are read off, and it is the mean of these that is taken as the true angle.

DECOMPOSITION, CHEMICAL, is the separation of the constituents of a body from one another, these constituents being obtained either free or in a new state of combination. Roughly speaking—for it is a difference of degree rather than of kind—decomposition is artificial or spontaneous. Artificial decomposition is produced in bodies, which retain their identity and permanence under ordinary influences, by the action of heat, light, electricity, or chemical reagents. Spontaneous, in bodies which quickly undergo change in ordinary circumstances, unless special precautions are taken to preserve them. The bodies of the mineral, and the definite crystallized principles of the organic world, belong to the first; organized matter, such as animal and vegetable tissues, organic fluids, such as blood, milk, bile, and the complex non-crystallized bodies, albumen, gelatine, emulsine, &c., belong to the second. Mineral bodies are decomposed into their proximate or ultimate constituents, limestone, for example, into lime and carbonic acid, oxide of mercury into mercury and oxygen, by heat alone, salts of silver by light, potash by a galvanic current, and all compound bodies by the application of chemical reagents, such as metals, acids, alkalies, salts, either at the ordinary or an elevated temperature, and the suitable arrangement of the methods for decomposing bodies constitutes chemical analysis. Definite organic bodies resemble inorganic in being influenced by these forces, but the result in their case is somewhat different, arising from their different composition. When a mineral body, a metallic salt for instance, is decomposed, it may split into its elements or proximate constituents, or it may pass through one or two stages in which the same elements are present, but in a different state of combination. In the case of an organic body it is possible to convert its constituents at once into their simplest states of combination, but it is also possible to obtain a large number of intermediate compounds by regulating the decomposing action. Thus in the combustion of sugar or of oil with a proper supply of air or oxygen, the only products are carbonic acid and water, but if these bodies be acted on by a limited amount of oxygen, or heated out of contact with it,

a large number of so-called decomposition products is the result, which are simpler than the original substance, but not so simple as carbonic acid and water. The more complex the original body the more varied the products; coal, for example, which by distillation yields at least fifty decomposition products. But while the bodies of the preceding class are quite stable in general, those of the second class are prone to decompose, if only they be exposed to moist air at a moderate temperature. Decomposition under those circumstances is known by certain names, according to its more prominent characters: fermentation (of which there are several kinds), when a body otherwise stable, such as sugar or alcohol, decomposes by contact with a ferment, which is an unstable body itself undergoing decomposition, and yields some well-marked definite product; putrefaction, the rapid decomposition of animal and vegetable matter which ensues when life has stopped, resulting in the formation of numerous not well defined products, accompanied by a characteristic and offensive odour, and caused by the complex organic principles passing into a simpler state, and involving in their decomposition all the others with which they are in contact; decay, the slow consumption of organized matter, especially vegetable, in which it becomes dry and pulverulent, and ultimately disappears. The phenomena of spontaneous decomposition lead to the supposition that the complex bodies, being held together by a certain degree of force, pass, when attacked by stronger forces, to a simpler state, apparently from a state of less stable to more stable equilibrium, the carbon, hydrogen, nitrogen, oxygen, sulphur, and phosphorus of which they are composed being ultimately oxidized to their fullest extent, so that fermentation, putrefaction, and decay are simply the outward manifestations of this passage.

To prevent these actions and to preserve the complex unstable bodies devices have been employed in all ages. The embalming of animals by the Egyptians, the tanning of leather, the saturation of timber with corrosive sublimate or kreasote, the inclosure of food in sealed vessels, and the extensive consumption of antiseptics and disinfectants, are all examples of attempts either to remove unstable bodies from the influence of the decomposing forces, or to convert them into a state in which these forces will have no effect. See EREMACAUSIS, FERMENTATION, PUTREFACTION.

DECOY, an artifice used by fowlers for capturing wild fowl. A decoy pond is kept in a secluded situation, where the use of guns is strictly prohibited. Tame ducks, called decoy ducks, are kept in it and regularly fed. Wild ducks and other wild fowl are thus induced to frequent the pond. A narrow canal or ditch leads away from the pond and terminates in a cover of network. The birds are enticed by the smoothness of the turf, which is carefully prepared, or decoyed by the tame birds, to enter this passage. When they have got far enough up the canal they are surprised by the dogs of the decoy man, who lies concealed to wait for them, and driven up to the network, where they are easily caught. The details of the arrangements differ in different cases, but this is the general principle of the contrivance.

Decoy, in military affairs, a stratagem to lure the enemy into an ambush, &c.

DECREE, in general, an order, edict, or law made by a superior as a rule to govern inferiors. It is used for a judicial decision in the Court of Chancery; also for the edicts of ecclesiastical councils. In the civil law it signified a determination or judgment of the emperor on a suit between parties. The compilation of the older Papal decretals and the decrees of the councils, made by the monk Gratianus in the twelfth century, is called the Decretum Gratiani. (See CANON LAW.) In the former German Empire the resolutions of the emperor, declared to the estates of the empire, were called *decrees*.—The old name of royal orders in France was *ordonnances* or *lettres*. The national convention, while it possessed sovereign power, used the expression *La convention nationale décrète*. During the period of the directory, and under the consular government, the expressions *arrêt* and *arrêter* were customary; but the imperial government used the words *imperial decree*, for instance, in the famous decrees of Berlin and of Milan.

DECREE NISI is the decree of divorce issued by the court on satisfactory proof being given in support of a petition for dissolution of marriage; it remains imperfect for at least six months, and is then made absolute on motion, subject to appeal (Wharton's Law Lexicon).

DECREPITATION is the crackling noise, accompanied by a violent exfoliation of their particles, which is made by several salts and earthy compounds on being suddenly exposed to heat. It appears to be referable to the same cause which occasions the cracking of glass and cast-iron vessels when they are incautiously heated; viz. the unequal expansion of the *laminæ* which compose them, in consequence of their imperfect power of conducting heat. It may be also caused by the sudden conversion into steam of the mother liquor inclosed mechanically within the crystals.

DECRESCENDO, an Italian term in music which denotes the gradual weakening of the sound.

DECRETAL, a general name for the Papal decrees, comprehending the rescripts (answers to inquiries and petitions), decrees (judicial decisions by the *Rota Romana*), mandates (official instructions for ecclesiastical officers, courts, &c.), edicts (Papal ordinances in general), and general resolutions of the councils. The oldest collection was made by Dionysius Exiguus in the end of the fifth century. A more celebrated one is that of Isidore, archbishop of Seville (who died 636). An enlarged collection was made in the ninth century, probably on the Rhine (perhaps by Benedictus Levita). This contained many pieces which have since been shown to be spurious. In modern times it has therefore been called the *pseudo-Isidorian collection*. Another celebrated collection is that of Gratian, dating from the twelfth century, and called the *Decretum*. See CORPUS JURIS.

DEE, a large river of Scotland, in the county of Aberdeen, which has its sources in the heights of Braemar and the Cairngorm Mountains, and discharges itself into the German Ocean after an irregular course, from west to east, of about 80 miles. A part of it forms the southern boundary of Aberdeenshire. It is a beautiful and rapidly-running river, having in many places high and rocky banks, overhung with large natural forests and plantations. It abounds in salmon, from which a very large annual revenue is obtained.

DEE, a river of Scotland, in the county of Kirkcudbright, which flows into the Solway Firth after a course of about 40 miles. Its run is rapid, and, like its Aberdeen namesake, much of it is adorned by steep romantic banks overhung with woods. It is navigable for about 2 miles from its mouth, and at the head of the navigation, at Tongland, it is crossed by a fine bridge, consisting of a single arch having a span of 110 feet.

DEE, a river of Ireland, which traverses the county of Louth and runs into the Bay of Dundalk.

DEE, a beautiful river in Merionethshire, Wales, which flows from the Lake Pimble-Meer, and falls into the Irish Sea about 15 miles below Chester. A

large aqueduct, conveying the water of the Ellesmere Canal, passes over it at Pont-y-Eyssyltan.

DEE, JOHN, born in London in 1527, and educated first at Chelmsford and then at Cambridge, went to Flanders in 1547 for the further prosecution of his studies, and on his return was admitted a fellow of Trinity College, then recently founded by Henry VIII. In early life he had devoted much of his time to mathematical, astronomical, and chemical studies; and in 1548 rumours began to prevail that he was addicted to the *black art*. They were probably well-founded; and to avoid the consequences he went abroad, first taking up his residence for two years at Louvain, and then visiting France, and delivering lectures on Euclid at Rheims. In 1551 he returned to England, and through the instrumentality of Cecil, who presented him to Edward VI., obtained a pension of a hundred crowns. The suspicion of the black art appears still to have clung to him, and shortly after Queen Mary's accession he was charged with practising against the queen's life by enchantment, and imprisoned. He obtained his liberty again in 1555, and after Queen Elizabeth's accession was consulted by Lord Dudley as to 'a propitious day' for the coronation. Lilly's account of him is that he was the queen's *intelligencer*, with a fixed salary; a great investigator of the more secret hermetical learning, a perfect astronomer, a curious astrologer, a serious geometrician, and excellent in all kinds of learning. After a visit to the Continent in 1564, to dedicate a work entitled Monas Hieroglyphica to the Emperor Maximilian, he returned to England, and took up his residence at Mortlake in Surrey, where he lived for some years in privacy. The nature of his employments again excited strong suspicion, and in 1576 he was furiously attacked by a mob, from which he had difficulty in escaping with his life. In 1578, during an illness of the queen, he was sent to consult with the German physicians and philosophers as to her recovery, and after his return was employed to draw up a sketch of the countries which, from having been discovered by English subjects, belonged to the crown. He accordingly prepared two rolls, giving both a geographical description and a historical account of the countries. These curious documents are still extant in the British Museum. In 1581 Dee engaged for his assistant Edward Kelly, an apothecary of Worcester, along with whom he is said to have held conversations with spirits, and practised many mysterious arts; and in 1583, having been introduced to a Polish noble of the name of Laski, who had come to England, and appears also to have been an adept, he resolved, with Kelly, to accompany him to Poland. After many wanderings, during which they resided for some time in the castle of a Bohemian noble, Dee left his assistant behind him, and returning home obtained from the queen, in 1595, the wardenship of Manchester College. Here he resided for nine years, and then returned to his old residence at Mortlake, where he died in 1608, at the advanced age of eighty-one. It has been supposed, with some plausibility, that Dee's character as an alchemist was merely assumed to enable him to act more securely and effectually as a spy in the employment of the English government.

DEED is a written contract, sealed and delivered. It must be written before the sealing and delivery, otherwise it is no deed; and after it is once formally executed by the parties, nothing can be added or interlined; and, therefore, if a deed be sealed and delivered with a blank left for the sum, which the obligee fills up after sealing and delivery, this will make the deed void. A deed must be made by parties capable of contracting, and upon a good consideration, and the subject-matter must be legally and formally set out. The formal parts of a deed are the premises, containing the number, names, additions, and titles of the parties; the covenants, which are clauses of agreement contained in the deed, whereby the contracting parties stipulate for the truth of certain facts, to bind themselves to the performance of some specific acts; the conclusion, which mentions the execution and date of the deed, or the time of its being given or executed, either expressly or with reference to some day and year before mentioned. Every deed must be founded upon good and sufficient consideration; not upon an usurious contract, nor upon fraud or collusion, either to deceive *bona fide* purchasers, or just and lawful creditors; any of which considerations will vacate the deed, and subject the parties to forfeiture, and in some cases imprisonment. A deed, also, without any consideration is void. A deed must be executed by the party himself, or by another for him in his presence, or with his direction; or, in his absence, by an agent authorized so to do by another deed, also under seal; and in every such case the deed must be made and executed in the name of the principal. A deed takes effect only from the day of delivery; and therefore if it have no date, or a date impossible, the delivery will in all cases ascertain the date of it; and if another party seal the deed, yet if the party deliver it himself, he thereby adopts the sealing and signing, and by such delivery makes them both his own. The delivery of a deed may be alleged at any time after the date; but unless it be sealed and regularly delivered it is no deed. Another requisite of a deed is that it be properly witnessed or attested: the attestation is, however, necessary rather for preserving the evidence than as intrinsically essential to the validity of the instrument. There are four principles adopted by the courts of law for the exposition of deeds, viz., 1. That they be beneficial to the grantee or person in whose favour they are intended to operate; 2. That where the words may be employed to some intent, they shall not be void; 3. That the words be construed according to the meaning of the parties, and the intent of the parties be carried into effect, provided such intent can possibly stand at law; 4. That they are to be expounded consonantly to the rules of law, and reasonably, without injury to the grantor, and to the greatest advantage of the grantee.

DEEG, a town and fortress, Hindustan, presidency of Bengal, in the province and 57 miles north-west of Agra, situated in the midst of marshes, and almost surrounded by water during a great part of the year. At the south-west corner is the lofty rock of the Shah Boorj, on which the citadel stands. Deeg is a place of great antiquity, and contains a remarkably fine palace, only surpassed in beauty by the Taj Mahal of Agra. Holkar was defeated here by the British under General Fraser in November, 1804, and the following month the town and fortress were taken by storm.

DEER. These beautiful and well-known quadrupeds belong to the order Ruminantia, or ruminating animals, and form the tribe or family Cervidæ, which comprises several genera formerly included in the single genus *Cervus*. They are distinguished from the antelopes (which see) by their horns being solid and deciduous, that is, falling off annually, and again renewed of a larger size than in the preceding year. These horns or antlers always exist on the head of the male, and sometimes on that of the female. In their first or young state they are covered by a velvet-like membrane, through which the blood circulates with great freedom. At this time the horn is extremely sensitive, the animal suffering much pain when it is roughly handled or struck. After the horn has attained its full growth the base becomes

surrounded with an irregular, tuberculous ring called the *burr*, and the blood-vessels gradually contract and diminish until they cease to convey blood to the velvet membrane, which then dries, loses its sensitiveness, and finally flakes off. The horns are of various forms. Sometimes they spread into broad palms, which send out sharp snags around their outer edges; sometimes they divide fantastically into branches, some of which project over the forehead, whilst others are reared upwards in the air; or they may be so reclined backwards that the animal seems almost forced to carry its head in a stiff, erect posture. Yet they communicate an air of grandeur, seeming like trees planted on the head of a living animal. The various species of deer, as well as the antelopes, invariably remain in their original situations when left to themselves. The deer tribe have been variously divided into groups and genera by different authors; we shall merely describe some of the more important species.

The *Moose* or *Elk* (*Alces malchis, Cervus Alces* of Linnæus), the *Original* of the Canadians, is perhaps the only deer whose general appearance can be called ungraceful, or whose proportions, at first sight, impress the beholder unfavourably. Its large head terminates in a square muzzle, having the nostrils protruded over the sides of the mouth; the neck, which is furnished with a short, thick mane, is not longer than the head, which, in the males, is rendered still more cumbrous and unwieldy by large palmated horns; under the throat is an excrescence, from which issues a tuft of long hair; the body, which is short and thick, is mounted on tall legs, giving a very ungainly aspect to the animal, which is not diminished when it is in motion, as its gait is a sort of shambling trot, very efficient, however, from the great length of its limbs. The moose inhabits the northern parts of both continents. It was once common in Sweden and Norway, but is now to be met with only in particular districts. Some consider the American moose a distinct species from the European elk. Their flesh is more relished by the Indians and persons resident in the fur countries than that of any other animal. It bears a greater resemblance, in its flavour, to beef than to venison. The large and gristly extremity of the nose is accounted an epicurean treat. Hearne states that the external fat is soft, like that of a breast of mutton, and, when put into a bladder, is as fine as marrow. In this it differs from all the other species of deer, of which the external fat is hard. The moose attains a large size, particularly the male, which sometimes weighs 1100 or 1200 lbs., and is higher at the shoulders than the horse. It is extremely shy and wary; and its sense of hearing being excellent, it is a difficult animal to hunt. When taken young it is easily domesticated. The skin, when properly dressed, makes a soft, thick, pliable leather.

The *Reindeer* (*Tarandus rangifer, C. tarandus* Linnæus) is spread over all the habitable parts of the Arctic regions and the neighbouring countries, in Europe being found in Norway and Sweden, more especially in Finmark and Lapland, in Northern Russia, nearly the whole of Siberia, and in North America as far south as the latitude of Quebec. It occurs also in Spitzbergen, Greenland, and Newfoundland. They have long been domesticated, and their appearance and habits have been frequently described. Their size varies much according to the locality, those in the more polar regions being the largest: 60 and 400 lbs. are said to be the extremes of weight. In winter the hair is grayish-brown, in summer dark sooty-brown. The American reindeer, or caribou, is less perfectly known: it has, however, so strong a resemblance in form and manners to the Lapland deer, that it has always been considered to be a variety of the same species. The American Indians have never profited by the docility of this animal to aid them in transporting their families and property, though they annually destroy great numbers for their flesh and hides. There appear to be several varieties of this useful quadruped peculiar to the high northern regions of the American continent, which are ably described by Dr. Richardson, one of the companions of Sir John Franklin in his earliest attempt to reach the north pole by land. The closeness of the hair of the caribou, and the lightness of its skin when properly dressed, render it the most appropriate article for winter clothing in the high latitudes. The hoofs of the reindeer are very large, and spread greatly, and thus enable it to cross the yielding snows without sinking. During the summer months this deer feeds upon every species of green herbage; but in winter his whole food is the lichen or moss, which he instinctively seeks under the snow. Reindeer have several times been transported to England and Scotland in large numbers, but they have invariably died, although they were attended by Laplanders, and could procure plenty of their natural food.

The *Stag* or *Red-deer* (*Cervus elaphus*) is a native of the temperate portions of Europe and Asia. The adults, male and female, in the summer have the back, flanks, and outside of the thighs fulvous-brown, with a blackish line running down the spine, marked on each side with a row of pale fulvous spots. These parts, in winter, are of a uniform gray-brown, and the head, sides of the neck, and under parts of the body and legs are also gray-brown; the buttocks and tail are always pale buff. In the German woods, the Ardennes, &c., are found breeds which are much darker coloured, and the English stags are redder than many others, and hence their name of red-deer. The young, during the first six months, are brown, spotted with white. The male stag is distinguished from the hind, or female, by his magnificent branching horns, the long, bristly hair of his throat, and the canine teeth in the upper jaw. During the first year the horns are represented only by a slight knob or protuberance; the second year they take the form of pointed spikes; the third year they have two or three tines or antlers; and they become more branched every year up to the seventh. After this they do not generally increase in the number of the branches, but become thicker and stronger. As many as twenty-eight, and even thirty-three antlers, however, have been counted on one horn. In the old language of the chase the stag had various technical names, according to age. The fifth year he was called a *stag*, the sixth a *hart* and a *hart of ten*, the seventh he was distinguished as a hart *croched*, *palmed*, or *crowned*. The horns are shed in spring, the old stags being first, and the young last, and the new horns are completed about the month of August. The rutting season follows in September, when the males become exceedingly fierce, waging desperate contests with each other, and sometimes attacking other animals and men. The hind goes with young eight months and some days. The calf is dropped in May or the beginning of June, and remains with the hind all the summer. In winter animals of all ages and both sexes congregate in herds, from which the older stags and the hinds withdraw as the spring comes on. The stag is very swift, and is an excellent swimmer, having been known to swim a distance of 6 or 7 miles. Stag-hunting has always been a favourite amusement among the great; and this animal was formerly preserved by the most stringent forest laws. William the Conqueror is said to have 'loved the tall deer as if he had been their father,' and to kill a man was a slighter offence than to kill a deer. Except in the

Highlands of Scotland red-deer are now scarcely found in this country.

An American representative of the European stag is the *Wapiti* or *Canada Stag* (*C. Canadensis*). 'The wapiti resembles the common stag in nearly all its proportions, but his size is far superior, being at the shoulder from 4 feet 4 to 4 feet 8 inches, the superiority of bulk appearing chiefly in the magnitude of the body. The hind is similar to the stag, with inferior proportions: the colour of both in the summer season is fulvous-brown on the back; a black spot on each side of the corners of the mouth descends on the under lip, round the eye brown, down the face darker; the neck also is darker than the body, being mixed with a purplish-brown tint on those parts; the limbs are anteriorly dark, and lighter fawn behind. Under the throat long hairs form a kind of dewlap, also darker in colour, separated from the brown of the thigh by a dark streak; the tail is short, but varies from 2 to 4 inches in length. The ears are long, lined with white hair within, and dark-coloured externally. Inside of the limbs and the belly the hair is close and buff-coloured' (Col. C. Hamilton Smith). The wapiti lives in herds, varying in number from ten or twenty up to several hundreds. They feed on grass, the young sprouts of trees, lichens, and in summer on aquatic plants, which they seek while sheltering themselves in the water from the bites of flies. They are good swimmers and swift runners, throwing their heads back so that the horns touch their shoulders as they bound through the forests. Their flesh is good, and their skin is manufactured into a variety of articles.

The *Fallow-deer* (*Dama vulgaris* or *Cervus Dama*) is smaller than the stag, being about 3 feet high at the shoulder, and is easily distinguished from it by its spotted coat, longer tail, and palmated horns. In the summer both male and female (buck and doe) have the back, flanks, and thighs of a fulvous-brown colour, with numerous white spots; in winter these parts are wholly brown, the buttocks are always white, with a black streak on either side; a dark line passes along the back; the belly, inside of the limbs, and under surface of the throat, are white. The young fallow-deer is called a *fawn*, the second year a *pricket*, the third year a *buck of the first head*. Fallow-deer are indigenous to Southern and Central Europe and Asia, but in this country exist only in a semi-wild state, having, it is said, been introduced by James I., at that time James VI. of Scotland. Large numbers of them are kept in gentlemen's parks, to the scenery of which they form a very charming addition. Their flesh is excellent, and far superior to that of the red-deer. The skin furnishes an excellent leather, and the horns, besides producing ammonia or hartshorn, are made into knife handles and other articles.

The *Roebuck* (*Capreolus dorcas* or *C. Capreolus*) is common enough in the northern half of Scotland, but in the rest of the island is rare. It is smaller than the fallow-deer, being about 2 feet 3 inches at the shoulder, and its horns are comparatively small and little branched. The colour is bright reddish in summer, the under parts white.

Other deer, worthy of description did space permit, are the Axis or Spotted Deer of India and Ceylon (*Axis maculata*), the Great Rusa (*Rusa hippelaphus*) of the Indian Archipelago, the Virginian Deer (*Cariacus Virginianus*), &c.

DE FACTO (Latin, in fact), a term used in contradistinction to *de jure* (by right). It is commonly used in regard to governments, some of which were supposed to be based on divine right, others on usurpation. A *de facto* government, when established, is now always recognized as *de jure*. The 11 Henry VII. cap. i. (1494) relieved from responsibility all subjects who obeyed a king *de facto*.

DEFAMATION. See LIBEL.

DEFAULT (English law) signifies generally any neglect or omission to do something which ought to be done. Its special application is to the appearance of a defendant in court when duly summoned on an appointed day. If he fail to appear judgment may be demanded and given against him by default.

DEFENDANT (English law), the person sued in a personal action or suit, or indicted for a misdemeanour.

DEFENDER (Scotch law) is the party against whom the conclusions of a process or action are directed.

DEFENDER OF THE FAITH (*Fidei Defensor*), a title belonging to the King of England, as *Catholicus* to the King of Spain, *Christianissimus* to the King of France, *Apostolicus* to the King of Hungary, &c. Leo X. bestowed the title of *Defender of the Faith* on Henry VIII., in 1521, on account of his book against Luther. When the title was recalled by the pope, it was confirmed by Parliament 35 Henry VIII. cap. iii., and has been assumed by the sovereigns of England ever since.

DEFERRED LIFE ANNUITIES (savings-bank). By Act 16 and 17 Vict. cap. xlv., the national debt commissioners are authorized to receive money from depositors for the purchase of government annuities. They may grant to or for the benefit of any depositor in a savings-bank, or other person whom the commissioners shall think entitled to be or to become a depositor in a savings-bank, any immediate or deferred life annuities depending on single lives, or immediate annuities depending on joint-lives with benefit of survivorship, or on any joint continuance of two lives to any amount not less than £4 nor more than £30 in the whole, to or for the benefit of any one person, and may receive payment for such immediate life annuities in one sum, or for such deferred life-annuities either in one sum or in annual sums payable for fixed periods. Husbands and wives may each receive annuities to the full amount, and trustees may receive them on behalf of females, infants, and persons of unsound mind; but not of any infant under ten years of age. Persons who have contracted for a deferred annuity, and are unable to continue their payments, may receive an annuity either immediate or deferred proportioned to what they have paid.

DEFFANT, MARIE DE VICHY-CHAMROND, MARQUISE DU, a French lady, distinguished for her talents and her intercourse with the literati of the last century. She was born in 1697 of a noble family, and received an education suitable to her rank. Her acquirements were very considerable, but no care seems to have been taken to regulate her temper and disposition, which were marked by a degree of selfishness which was conspicuous throughout her life. In 1718 she married the Marquis du Deffant, from whom she separated after ten years. During the latter part of her long life she became the centre of a literary coterie, which included some of the greatest geniuses of the age. Among the females remarkable for their wit and talents in the eighteenth century Madame du Deffant claims a distinguished place, though she left no monument of her abilities except her epistolary correspondence, which has been highly praised by her friend D'Alembert as affording a model of style in that species of composition. During the last thirty years of her life she was afflicted with blindness. She died in 1780. In 1810 was published Correspondance inédite de Madame du Deffant, avec D'Alembert, Montesquieu, le Président Hénault, la Duchesse du Maine; Mesdames de Choiseul, de

Staël; le Marquis d'Argens, le Chevalier d'Aydie, &c., three volumes, 8vo. Her letters to the celebrated Horace Walpole have likewise been printed.

DEFILE, in military language, is a narrow way, admitting only a few persons abreast. Hence to march before any one with a narrow front, in column or by files, is called defiling.

DEFINITION (from the Latin *definitio*) of a thing signifies, in lexicography, a concise account of its essential and characteristic points. A definition should embrace all the essential properties of the object intended to be defined, and not admit any which do not belong to it, which is often extremely difficult, on account of the shades and gradations by which different things are blended. The most simple things are the least capable of definition, from the difficulty of finding terms more simple and intelligible than the one to be defined. According to the old scholastic logic, a definition must give the mark of the genus (*nota generalis seu genus*), and of the species (*nota specialis seu differentia specifica*); for instance, a barn is a building (*nota generalis*) for the purpose of preserving corn, &c. (*nota specialis*).

DEFLAGRATION. The rapid combustion produced when to an incandescent combustible, such as coal or charcoal, is added a liquid or solid supporter of combustion, such as fuming nitric acid, the nitrate of potassium, of sodium, or of other metals, chlorates, &c. At the high temperature the compound is decomposed, oxygen is liberated, which immediately produces a quick combustion of the part with which it is directly in contact.

DEFOE, Daniel, a writer of great ingenuity and fertility, was born at London in 1661. His father's name was simply Foe. He received his education at an academy at Newington Green. He was intended for the Dissenting ministry, and received a fair education. He appears to have begun business early, and in 1682–83 he published several political tracts. In 1685 he joined the insurrection of the Duke of Monmouth, and had the good fortune to escape to London, where he was engaged for some years as a hose-factor in Freeman's Court, Cornhill. His commercial speculations, however, failing, he became insolvent, and owing to the severity of the bankruptcy laws fled from his creditors. A composition was arranged on his bond, which he discharged, and afterwards, by his own account, reduced his debts, which originally amounted to £17,000, to £5000. His business was again ruined by a state prosecution and imprisonment, which prevented his paying the remainder. He subsequently obtained an appointment under government, which he held from 1695 to 1699, and afterwards in various mercantile speculations. His business misfortunes, however, caused him to turn his attention more assiduously to literature. In 1697 he wrote an essay on Projects. In 1701 appeared his satire, The True-born Englishman, the object of which was to show the folly of the popular objection to King William, as a foreigner, by a people who were themselves a mixture of so many races. In 1702, when the High Church party seemed disposed to carry matters strongly against the Dissenters, he published The Shortest Way with the Dissenters, being an ironical recommendation of persecution, so gravely covered that many persons were deceived by it. It was, however, voted a seditious libel by the House of Commons, 25th February, 1703; and the author avowing himself, to secure his printer and publisher, he was prosecuted to conviction, and sentenced to fine, imprisonment, and the pillory. He underwent the latter punishment with great equanimity, and was so far from being ashamed of it that he wrote a Hymn to the Pillory, alluding to this circumstance. In February, 1704, while in Newgate, he commenced the Review, a sort of newspaper containing papers of literary and political criticism, supposed to be discussed by a scandal club. This paper was continued for nine years, and was entirely conducted by Defoe, even during protracted absences from England, during one of which, in 1710–11, he edited forty-five numbers of the Edinburgh Courant. He was at length liberated from Newgate by the interposition of Harley; and the queen herself sent money to his wife and family. Harley employed him in several important missions, particularly in the negotiations for the union with Scotland, of which he wrote the history. In 1706 he published his largest poem, entitled Jure Divino, a satire on the doctrine of divine right. When the accession of the house of Hanover became an interesting topic, he wrote in its favour, but so obtuse was the public to his irony, that he was imprisoned for his productions as libels in favour of the Pretender. In 1715 he was seized with apoplexy while engaged on his work, An Appeal to the Honour and Justice of his Enemies. He then began a new line of composition, though he still wrote for the newspapers, and the same year (1715) he published The Family Instructor, a work inculcating moral and religious duties in a lively manner, by narration and dialogue. To this work his well-known Religious Courtship, published in 1722, formed a third volume. In 1719 appeared the most popular of all his performances—The Life and Surprising Adventures of Robinson Crusoe, the favourable reception of which was immediate and universal. The success of Defoe in this performance induced him to write a number of other lives and adventures in character; as Moll Flanders, Captain Singleton, Roxana, Duncan Campbell, and The Memoirs of a Cavalier, pronounced by the Earl of Chatham the best history of the civil war extant. In 1722 he published a Journal of the Plague in 1665, in the person of a citizen supposed to have been a witness of it. The natural manner in which it is written deceived the celebrated Doctor Mead, who thought it genuine. In 1724 he published the Great Law of Subordination, and in 1726 his Political History of the Devil, to which he afterwards added, in the same style of reasoning, wit, and ridicule, a System of Magic. He is also author of a Tour through the Island of Great Britain, The Complete English Tradesman, a Plan of English Commerce, and various other productions. He died in April, 1731. Among other accounts of him may be mentioned, Memoirs of the Life and Times of Daniel Defoe, by Walter Wilson (three volumes, London, 1830), and the Life by William Lee, published in 1869, along with a large number of writings not previously attributed to Defoe, and many of them of doubtful authenticity (London, 3 vols.)

DE GÉRANDO, Joseph Marie, Baron, a French philosopher and statesman, born in Lyons on 29th February, 1772, was the son of an architect, and originally educated for the church. On the siege of Lyons by the revolutionary troops in 1793 he took up arms in its defence, and greatly distinguished himself by his bravery, but was subsequently obliged to flee for safety to Switzerland, whence he proceeded to Italy and obtained employment in a merchant's office in Naples. He returned to France on the proclamation of an amnesty, and joined a cavalry regiment. While in garrison at Colmar he composed an essay on the theme proposed by the French Institute, Quelle est l'Influence des Signes sur l'Art de Penser? and gained the prize. In 1799 he was invited to Paris, and took office under Lucien Bonaparte as minister of the interior, became secretary-general of that department in 1804, under Champagny, whom the following year he accompanied to

Italy. In 1806 he was appointed master of requests, and was afterwards engaged in the organization of Tuscany and the Papal States on their union to France. In 1811 he was made a councillor of state, and in 1812 governor of Catalonia. He retained the former dignity after the restoration. In 1819 he commenced a course of lectures in the Faculté de Droit, in Paris, on public and administrative law, which were suspended in 1822, and resumed under the Martignac ministry in 1828. He was raised to the peerage in 1837, and died in 1842. De Gérando has acquired great fame by his philosophical writings, in which he follows with some deviations the school of Condillac. His principal works are Des Signes et de L'Art de Penser considérés dans leur Rapports Mutuels (four vols. 8vo, Paris, 1800), an enlargement of the dissertation formerly written for the French Institute; De la Génération des Connaissances Humaines (Berlin, 1802); Histoire comparée des Systèmes de Philosophie (three vols. 8vo, Paris, 1804), completed after his death in eight volumes; Du perfectionnement Moral et de l'Éducation de Soi-même, a treatise which gained the prize of the French Academy in 1825; De l'Éducation des Sourds-muets de Naissance (two vols. 1827); Institutes du Droit administratif Français, ou Éléments du Code administratif réunis et mis en ordre (four vols. 8vo, 1829 and 1845); and De la Bienfaisance Publique (four vols. 8vo, 1839).

DEGGENDORF, a town of Lower Bavaria, 30 miles N.W. of Passau, on the left bank of the Danube, over which there is a bridge about 1200 feet long. It is well built, contains several churches, to one of which a pilgrimage is annually made by large numbers of persons; and has manufactures of linen and pottery, and a considerable trade. Pop. 5452.

DEGRADATION. The ecclesiastical censure, by which a clergyman is divested of his holy orders, is termed *degradation*. The term is also applied to the deprivation of offices not ecclesiastical. Geliot, in his Indice Armoriel, describes the degradation of Franget, a Gascon captain, for surrendering Fontarabia under Francis I. The accusation of treason was pronounced before twenty or thirty cavaliers. The culprit was armed at all points, and his shield, reversed, was suspended on a stake before him. By his side twelve priests chanted the vigils of the dead. At the pause after each psalm the officers stripped the knight of a piece of his armour, till he was quite bare. His shield was then broken in three pieces, and the king-at-arms poured a basin of hot water on his head. The criminal was afterwards let down from the scaffold by ropes under his arms, and, being placed on a bier covered with grave-clothes, and preceded by a priest, chanting a mass for the dead, was delivered to the civil judge and the executioner. His life, however, eventually was spared, since life, under such circumstances, was considered more bitter than death.

DEGREE, in algebra, a term applied to equations, to distinguish the highest power of the unknown quantity. Thus if the index of that power be three or four, the equation is respectively of the third or fourth degree.

DEGREE, in geometry or trigonometry, is the 360th part of the circumference of any circle: every circle being considered as divided into 360 parts called degrees, which are marked by a small ° near the top of the figure; thus 45° is 45 degrees. The degree is subdivided into sixty smaller parts, called *minutes;* the minute into sixty others called *seconds;* the second into sixty *thirds*, &c. Thus 45° 12′ 20″ is 45 degrees, 12 minutes, 20 seconds. The magnitude or quantity of angles is estimated in degrees; for, because of the uniform curvature of a circle in all its parts, equal angles at the centre are subtended by equal arcs, and by similar arcs in peripheries of different diameters; and an angle is said to be of so many degrees as are contained in the arc of any circle comprehended between the legs of the angle, and having the angular point for its centre. Thus we say 'an angle of 90°,' or 'of 45° 24′.' It is also usual to say 'such a star is elevated so many degrees above the horizon,' or 'declines so many degrees from the equator;' or 'such a town is situated in so many degrees of latitude or longitude.' A sign of the ecliptic or zodiac contains thirty degrees. The French divided the circle into 400 degrees, the degree into 100 minutes, the minute 100 seconds, but have resumed the old division.

Degree of Latitude is the space or distance on the meridian through which an observer must move to vary his latitude by 1°, or to increase or diminish the distance of a star from the zenith by 1°; and which, on the supposition of the perfect sphericity of the earth, is the 360th part of the meridian. The length of a degree of a meridian or other great circle, on the surface of the earth, is variously determined by different observers, and the methods made use of are also various; and, therefore, without entering into the history of all attempts of this kind, we shall present our readers with the following

Table of the Different Lengths of a Degree, as Measured in various Parts of the Earth, the Time of its Measurement, the Latitude of its Middle Point, &c.

Date.	Latitude.	Extent in English miles and decimals.	Measurer.	Countries.
1525	49° 20½′ N.	68·763	M. Fernel.....	France.
1620	52 4 N.	66·091	Snellius	Holland.
1635	53 15 N.	69·545	Norwood	England
1644		75·066	Riccioli	Italy.
1669 } 1718 }	49 22 N.	68·945 69·119	Picard ..... } Cassini..... }	France.
1737	66 20 N.	69·403	Maupertuis, &c.	Lapland.
1740	49 22 N. 45 00 N.	69·121 } 69·092 }	CassiniandLa-caille ..... }	France.
1744	0 0	68·751 68·732 68·713	Juan & Ulloa } Bouguer..... } Condamine .. }	Peru.
1752	33 18½ S.	69·076	Lacaille.....	Cape of Good Hope.
1755	43 0 N.	68·998	Boscovich .... }	Italy.
1764	44 44 N.	69·061	Beccaria ..... }	
1766	47 40 N.	69·142	Liesganig	Germany.
1768	39 12 N.	68·893	Mason & Dixon	United States.
1802	51 29 N.	69·146	Lieut.-col. Mudge	England.
1803	66 20½ N.	69·292	Swanberg, &c...	Lapland.
	12 32 N.	68·743	Lambton	Mysore.
1808	44 52½ N.	68·769	Biot, Arago, &c.	France.

Ellipticities of the Earth, expressed in Parts of its Equatorial Diameter.

Authors.	Ellipticities.	Principles.
Huygens,.....	a 579th }	Theory of Gravity.
Newton,.....	a 230th }	
Maupertuis, &c.	a 314th a 129th a 213th	Mensuration of arcs.
Swanberg, ...	a 323·065th	
Clairaut,.....	an 11·55th	Rotatory motion.
	a 337th	Vibrations of the pendulum.
Treisnsoker, ...	a 329th	Occultations of the fixed stars.
Laplace,.....	a 334th } a 306th }	Precession, nutation, pendulum, theory of the moon, &c.

Degree of Longitude is the space between the two meridians that make an angle of 1° with each other at the poles, the quantity or length of which is variable, according to the latitude. The following table expresses the length of a degree of longitude in different latitudes, supposing the earth to possess a perfect sphericity:—

Deg. Lat.	English miles.	Deg. Lat.	English miles.	Deg. Lat.	English miles.	Deg. Lat.	English miles.	Deg. Lat.	English miles.
0	69·07	20	64·84	40	52·85	60	34·50	80	11·98
1	69·06	21	64·42	41	52·07	61	33·45	81	10·79
2	69·03	22	63·97	42	51·27	62	32·40	82	9·59
3	68·97	23	63·51	43	50·46	63	31·33	83	8·41
4	68·90	24	63·03	44	49·63	64	30·24	84	7·21
5	68·81	25	62·5[illegible]	45	48·74	65	29·15	85	6·09
6	68·62	26	62·02	46	47·93	66	28·06	86	4·81
7	68·48	27	61·48	47	47·06	67	26·96	87	3·61
8	68·31	28	60·93	48	46·16	68	25·85	88	2·41
9	68·15	29	60·35	49	45·26	69	24·73	89	1·21
10	67·95	30	59·75	50	44·35	70	23·60	90	0·00
11	67·73	31	59·13	51	43·42	71	22·47	..	..
12	67·48	32	58·51	52	43·48	72	21·32	..	..
13	67·21	33	57·87	53	41·53	73	20·17	..	..
14	66·95	34	57·20	54	40·56	74	19·02	..	..
15	66·65	35	56·51	55	39·58	75	17·86	..	..
16	66·31	36	55·81	56	38·58	76	16·70	..	..
17	65·98	37	55·10	57	37·58	77	15·52	..	..
18	65·62	38	54·37	58	36·57	78	14·85	..	..
19	65·24	39	53·62	59	35·54	79	13·17	..	..

Degrees, Measurement of.—After the immortal Newton had taught that the earth, on account of its motion round its axis, must be highest near the equator, and that the diameter of the equator must be longer, by one 230th part, than the diameter from pole to pole, the French wished to investigate the subject further by actual measurement. Newton gave them warning that the difference between a degree at Bayonne and one at Dunkirk was so trifling that it could not be detected at all with the imperfect instruments then in use; and was, in fact, afraid that they might come to a result directly opposite to what he conceived to be correct, and bring confusion into science. But his warnings were of no avail. The measurement was begun, and the fear of the great philosopher was realized; for the result was, that the axis of the poles was longer than a diameter of the equator, and that the earth was, in form, more like a lemon than an orange. For forty years disputes were maintained on this point without settling the question; and at last the Academy of Sciences resolved, on the proposition of Condamine, to have a degree measured at the equator (the expedition went to South America in 1735), and one in Lapland (Kittis and Tornea being the extreme stations to which the expedition was sent in 1736). It was found that the northern degree was greater than that under the equator, and that Newton's conjecture was right. But the question still remained, How great is the flattening of our planet? The theory said one 230th part, if the earth had been in a perfectly liquid state when it began its rotation. The calculations, however, always gave different results, varying according to the different measurements adopted as the basis of them; for measurements had been made, not only in America and Lapland, but also in France, England, Hungary, and Italy. It was concluded that the earth was not a regular body, but had great local inequalities. Though this was possible, yet the conclusion was too hasty, because these supposed inequalities might be caused by the insufficiency of the instruments, and by the smallness of the arcs measured. When the French established their new and admirable system of measures and weights upon the basis of the metre, which was to be the ten-millionth part of the distance from the equator to the pole (3·2808992 English feet, or 39·37 inches), it was necessary to know with accuracy the circumference and the flattening of the earth. A measurement, therefore, took place in France, not of one degree, but of ten degrees, from Dunkirk to Formentera, one of the Balearic Islands. In Sweden, in 1802, the degree, which eighty years before had been measured by Maupertuis, was now measured again with better instruments, and thus the circumference and flattening of the earth were pretty well ascertained. After the Peace of Amiens the measurements of degrees just made in England, under General Roy, by Lieutenant-colonel Mudge, were connected with those in France; and thus an arc of twenty degrees, from the Balearic Islands, near the coast of Spain, over France and England, to the Orkneys, has been measured, and the flattening of the earth has been determined as accurately as it can be done in Europe. The flattening has been found to be 1-304th. In India, the measurement of a degree, begun by Lambton, was completed by Everest. These measurements are among those enterprises which do mankind much honour, because they are not undertaken for the sake of immediate profit, nor of bare utility, but from an ardent desire of knowing the truth, from the same deep thirst for knowledge which has so often impelled men to explore the icy seas of the poles and the burning deserts of Africa. The history of such expeditions is better fitted to awaken a generous spirit in youth than the oft-repeated tale of conquest and bloodshed.

Measurement of a Degree of Longitude.—The degrees of longitude are largest under the equator, and diminish continually towards the pole. Under the equator a degree of longitude contains 60 geographical, 69½ statute miles. If the form of the earth is not entirely regular, the degrees of longitude on the same parallel of latitude cannot all be of the same length; and it has been proposed to investigate this by actual measurement. This task is, in the trigonometric part, as easy as the measurement of a degree of latitude; but in the astronomical part it is fifteen times more difficult. The difference of the longitude of two places is determined by the difference of the hour of the day at the same point of time in the two; as a place situated fifteen degrees to the east of another has noon a whole hour earlier. One hour, therefore, corresponds to fifteen degrees, or 1042½ statute miles, under the equator, or 5,504,400 feet; a minute of time to 91,740 feet, and a second of time to 1529 feet. A mistake of a second of time, therefore, in calculating the longitude of two places, makes a corresponding error in space. To determine time within two or three seconds, by means of rockets, at a distance of 1042½ miles is impossible; and whilst the measurement of an arc corresponding to this distance, trigonometrically, may be attended with an error to the amount of 200 feet, an astronomical measurement would leave an uncertainty of 2000 feet. The earlier measurements of the French were directed, in the north, by Maupertuis; in the south by Bouguer. Since that time measurements have been made in all the great continents of the globe—in Pennsylvania, in the time of Maskelyne, by Mason and Dixon; at the Cape of Good Hope by Lacaille, completed by Maclear; in Prussia by Bessel; in Russia by Struve; in Denmark by Schumacher; and in England by Roy, Kater, and Colby. The French arc from Formentara to Dunkirk was measured by Mechain and Delambre. The results of the measurements, as given by Airy, make the equatorial diameter 7925·648, and the polar diameter 7899·170 miles. Bessel's results are almost identical, viz. equatorial diameter 7925·604, and polar diameter 7899·114 miles. Detailed notices on the measurements of degrees are given by Delambre, in his Astronomie, iii. chap. xxxv. See also Bode, Anleitung zur Allgemeinen Kenntniss der Erdkugel.

DEGREE, in music, represents a step on the printed stave. Notes written on the same line or space, though separated by sharps or flats, are said to be on the same degree.

DEGREE, in universities, denotes a distinction conferred on the students or members thereof, as a testimony of their proficiency in the arts or sciences, and entitling them to certain privileges. The degrees are much the same in all universities; but the laws thereof, and the previous discipline or exercise, differ. The degrees are, bachelor, master, and doctor; instead of which last, in some foreign universities, is licentiate.

DEHRA DOON, a beautiful and fertile valley, Hindustan, North-west Provinces, at the S.W. base of the lowest and outermost ridge of the Himalaya. It is bounded on the N. by the Jumna, N.E. by the mountains of Gurwhal, from 7000 to 8000 feet high, S.E. by the Ganges, S.W. by the Sewalik range, 3000 to 3500 feet high. Its length from S.E. to N.W. is about 45 miles; breadth, from 15 to 20 miles. The chief town in the valley is Dehra. The valley is remarkable for the beauty of its scenery. In its general appearance it is sloping and picturesque, with finely cultivated fields separated with hedges, and intersected with streams and tracts of woodland, and thus closely resembles the scenery of England. The climate is temperate and healthy for Europeans, except from July to September, when the monsoon prevails and fever is rife.

DEIDAMEA (*Deïdameia*), daughter of Lycomedes: she bore Pyrrhus and Oneirus to Achilles, during his abode at Scyrus.

DEI GRATIA (*by the grace of God*), a formula which sovereigns add to their title. The expression is taken from an epistle of the apostle Paul, and was used first by the clergy in the time of Constantine the Great. In the times of the Carlovingian race the secular princes also assumed it. The high clergy of the Catholic Church used it with an addition: 'By the grace of God and the apostolic see.'

DEIOCES, or DEJOCES, who flourished about seven centuries B.C., rose from a private station to be the founder of the Median Empire. By acting as arbitrator in the disputes which took place in his own vicinity, he had acquired a high reputation for wisdom and justice; and when the Medes, in consequence of their revolt from the Assyrians, stood in need of a sovereign, they found none whose claims to the honour seemed stronger than those of Deioces. Immediately after his election he assumed great state, surrounded himself with body-guards, and built the city of Ecbatana, in the centre of which he resided, almost wholly hidden from public view, transacting all business by deputies. His administration, however, was vigorous, and after a peaceful reign of thirty-five years he was able to transmit the throne, without a contest, to his son Phraortes.

DEIOTARUS, tetrarch of Galatia, received from the Roman senate the title of *king* of that province and Armenia Minor, on account of services rendered to the Romans in the Asiatic wars. In the civil war he joined the party of Pompey. Cæsar took from him Armenia, obliged him to march with him against Pharnaces, and left him nothing but the title of royalty. He was accused of having plotted against the life of Cæsar, from which charge Cicero defended him in an oration yet extant. After the murder of Cæsar he returned to his dominions, joined Brutus, and afterwards Augustus. He died at an advanced age 30 B.C.

DEIR, an Arabian word signifying *house*, as *Deir-el-Kamar*, the house of the moon. It often occurs in geographical compounds.

DEISM (from the Latin *deus*), as a philosophical system, that which finds in God the cause of all things. It is, as such, opposed to *atheism*. In a religious point of view it is used for the belief in natural religion, contradistinguished from the belief in revelation, and is considered by many persons almost equivalent to atheism, because, *practically*, there is little difference between them. *Theism* has the same signification, and is derived from the Greek *theos* (god). *Deists* or *theists* are sometimes called 'free-thinkers.'

DEJANIRA, in Greek mythology, the daughter of Œneus, king of Calydon, a city of Ætolia, and his wife Althæa, or of Bacchus and Althæa, who, with her sister Gorge, alone retained her form, when her other sisters were transformed into birds, while mourning for their brother Meleager. She was betrothed to Achelous, the god of the river of the same name, who, on her account, engaged in a combat with Hercules. Achelous was overcome, and the maiden became the prize of the victor, who, on his return to his country, was stopped in his way by the river Evenus, which had overflowed its banks. In this emergency the Centaur Nessus offered to take Dejanira across the river on his back. Hercules readily consented and passed over the river first; but when he had reached the opposite bank he saw that the Centaur was attempting to offer her violence. Enraged at the sight he pierced him with an arrow which had been dipped in the blood of the hydra. Nessus, perceiving his death approaching, wished to be revenged, and gave to Dejanira his bloody tunic, telling her that if her husband was unfaithful she should persuade him to put this on, and it would reclaim him from his unlawful passion. The credulous Dejanira accepted the present. Hearing subsequently that Hercules was captivated by the charms of Iole, the daughter of Eurytus of Eubœa, she sent him the tunic of Nessus by a young slave, named Lichas, with the tenderest messages. Hercules joyfully accepted the fatal present and hastened to make use of it, but was thrown into the most violent agony. In his fury he hurled Lichas into the sea, where, by the compassion of the gods, he was changed into a rock. Then having hewed down some trees on Mount Œta, and erected a funeral pile, he ascended the pile and begged his friend Philoctetes to set fire to it. When Dejanira heard of the death of Hercules she was so overcome by anguish that she destroyed herself.

DEKEN, AGATHE, a Dutch authoress, born in 1741, in the village of Amstelveen, near Amsterdam. She wrote Dutch novels and poems of merit; among others, Liederen voor den Boerenstand. She died in 1804.

DEKKER, or DECKER, JEREMIAS DE, a Dutch poet, born at Dort in 1609 or 1610. His father, Abraham Dekker, originally from Antwerp, had entered the army, embraced the reformed faith, and for three years been one of the most valiant defenders of Ostend against the Archduke Albert. After its capitulation he quitted the Spanish Netherlands, abandoned his military life, and settled first at Dort and afterwards at Amsterdam. His son early showed an acute intellect, combined with a lively fancy and a sound judgment, and formed his taste by a diligent study of ancient and modern literature. Poetry was and remained his favourite occupation, and his compositions were particularly distinguished by clearness of style and force of thought. His first published poetical work was The Lamentations of Jeremiah; and several others which soon followed it were also translations. Many of his poems owe their origin to his warm feelings for love and friendship, and these indeed form the most remarkable productions of his muse. His Love of Gold, a powerful satire, and his Goede Vrijdag, or the Passion of Christ, as well as his lyric poems, are still in high estimation; and his Epigrams (Puntdichten) are, beyond dispute, the best of the kind which the literature of that period pro-

duced. He died in 1666. The best edition of his poems, accompanied with a biography, was published by Brouerius van Nideck (two volumes, Amsterdam, 1726).

DEKKER, Decker, or Deckar, Thomas, an English dramatic and miscellaneous writer, who lived in the reigns of Elizabeth and James I. He seems from his writings to have been a native of London, and is first mentioned as a theatrical writer in 1597. He was one of the literary antagonists of Ben Jonson, who satirized Dekker in his Poetaster, and the latter took his revenge in his Satyromastix. He appears to have lived from hand to mouth, and been often in difficulties, imprisonments for debt being almost the only record, besides his works, that is left of him. Among his writings may be mentioned the Seven Deadly Sinnes of London, a moral play; the Double P P, a violent tract against the Catholics; A Knight's Coniuring, in which he introduces Chaucer, Spencer, and many other dead poets. Besides his own plays, some of which are considered meritorious, he co-operated with Massinger in the Virgin Martyr, and with Ford in the Sun's Darling, a moral masque; the Pleasant Comedie of Old Fortunatus (1600), and the Honest Whore (1604), are among the most esteemed of his dramas. The number of Dekker's plays is about twenty-eight, of his tracts about twenty-five.

DE LA BECHE, Sir Henry Thomas, an eminent practical geologist, descended from an ancient family, and the only son of Colonel Thomas de la Beche, of Halse Hall, Jamaica, was born near London in 1796. When young he went to Jamaica, and returned from thence with his mother, after his father's death. He was educated at Sandhurst College, and entered the army in 1814. The military profession was soon, however, abandoned by him, with the view of devoting himself to the study of geology, in which he had been early led to take an interest. He married in 1818, travelled on the Continent in 1820, and in 1824 visited his paternal estates in Jamaica. During these visits he actively pursued his geological investigations, and published some papers regarding them. He was one of the first to project the grand scheme of forming a geological survey of the United Kingdom. He commenced a map of Cornwall on his own responsibility, but the government soon took up the scheme and instituted the geological survey, at the head of which he was placed in 1832. In a few years complete geological maps of the western counties of England were produced and published. His Report on the Geology of Cornwall, Devon, and West Somerset appeared in 1839. The success of these undertakings induced government to separate the geological from the ordnance survey, and intrust the superintendence of it to Mr. De la Beche. During the progress of his geological operations many valuable specimens of rocks and minerals had been collected, and the nucleus thus formed of the Museum of Practical Geology, which was placed at first in a house in Craig's Court, London, and afterwards removed to the building specially erected for it in Jermyn Street, Westminster. The practical advantages resulting from his labours having now become manifest, the School of Mines was established by government, and opened by an address from him on 6th Nov. 1851. About this time he was attacked by paralysis, but his intellect remained unimpaired, and to the last he took an active interest in the School of Mines. He died on 13th April, 1855. Sir Henry de la Beche is the author of the Geological Manual, which was published in 1831, and has gone through several editions; Researches in Theoretical Geology (1834); and How to Observe: Geology (1835). He has also contributed numerous papers to the Transactions of the Geological Society. He became F.G.S. 1817; F.R.S. 1819; president of the Geological Society, 1847; knight, 1848.

DELABORDE, Henry François, Count, born in 1764 at Dijon, where his father was a baker, had devoted himself to science when the commencement of the revolution induced him to exchange it for military service. After he had repeatedly distinguished himself in the republican armies, and risen through the various gradations of rank, he was in 1794 appointed brigadier-general, and shortly after head of the general staff of the army before Toulon. Placed, during the siege of the town by Dugommier, at the head of a division, he contributed greatly to its capture. In the following year he fought with distinction in the army of the West Pyrennees in Spain; and in 1796, after peace in the Peninsula, he was despatched with a division to the Rhine, where he took possession of the Breisgau, while Moreau pressed forward into Bavaria. In Germany he found little opportunity to acquire new fame by warlike exploits. After the Peace of Luneville he was, in 1802, named governor of the thirteenth military division, and in 1804 an officer of the Legion of Honour. In 1807 he was employed under Junot in Portugal, and the following year in Spain. While there Napoleon conferred on him the title of count. In the Russian campaign of 1812 he was placed under Mortier, and was afterwards named governor of the castle of Compiègne. After the restoration he lost this appointment, but received a pension of 15,000 francs, the order of St. Louis, and the command of a body of troops at Toulouse. These favours were all forgotten when Napoleon again made his appearance, and he became one of his most zealous adherents. After the second restoration he was placed on the list of the officers who were to be criminally prosecuted. In 1816 he appeared before the criminal court in Paris, but in consequence of an error in his name, which was written *de Laborde* instead of *Delaborde*, the case could not be proceeded with. It afterwards lay over, and he lived retired and unannoyed till his death in 1833.

DELACROIX, Ferdinand Victor Eugène, an eminent French painter, was born 26th April, 1799, at Charenton-St.-Maurice, near Paris. He entered first the studio of Pierre Guérin, but he soon gave up his frigid academical style, and joined himself to those painters who were labouring to bring about a revolution in the art, and who received the name of the 'romantic' school. His first painting, Dante and Virgil in the Infernal Regions, attracted much notice in the exhibition of 1822. This picture displayed a wide departure from the colouring and manner of the school of David, and accordingly it gave rise to enthusiastic praise on the one side, on the other to contemptuous depreciation, but everywhere to wonder. His Massacre in Scio, 1824, was a formal declaration of war against the school of the classicists, who named it A Massacre of Painting. These two works were followed by the Execution of the Doge Marino Falieri (1826), the Death of Sardanapalus (1827), and the Murder of the Bishop of Liége (1830)—three pieces painted with fire and vigour. His sympathy with the revolutionary party was shown by his celebrated picture of the Goddess of Liberty at the Barricades. From that time he held aloof from every party, whether in politics or art, and the life of retirement that he henceforth led was interrupted for a short time only in 1831, when he joined the embassy sent by Louis Philippe to the Emperor of Marocco. To this journey we are indebted for several pictures remarkable for their vivid realization of oriental life as well as their masterly colouring. They are the Jewish Marriage, Muley Abderrhaman

with his Body-guard, Algerian Ladies in their Chamber, Moorish Soldiers at Exercise, and several scenes of common life. In spite of his undoubted genius Delacroix failed in gaining popularity with the general public, and he would have found it difficult to push himself into notice had not the government given him constant employment. He was commissioned not only with the decoration of public buildings, such as the Luxembourg Palace, the town-hall, and the Louvre, but large paintings were executed by him for the Parisian churches, and for the historical museum of Versailles, in which there are two of his masterpieces—the Battle of Taillebourg (1838), and the Taking of Constantinople by the Crusaders (1841). Through these public commissions his name gradually became known to private persons, so that in the last thirty years of his life he had always plenty of work on his hands. In 1857 the Academy elected him a member of their body. He died at Paris August 13, 1863. Delacroix was an artist of great versatility; mythology, legend, history, and poetry by turns furnished him with subjects, and in addition he painted portraits, allegorical and genre pictures, hunting scenes, &c.; but all exhibit at once his strength and his weakness—brilliant colouring and incorrect drawing.

DELAGOA BAY, in South-east Africa, lat. 26° 4′ S.; lon. 33° 1′ E.; formed by a narrow slip of land projecting from the mainland, and parallel to it, called the peninsula of Inyack. The bay stretches north and south upwards of 40 miles, with a breadth of from 16 to 20 miles. Though crossed at its entrance by a bar, on which, during the south-east monsoon, the sea breaks with great fury, it is accessible to vessels of the largest class, and is the most considerable bay on the east coast of Africa, both on account of its extent and of the deep and large rivers that discharge themselves into it, the principal of which are the Mapoota, English River, and the Manice. But the great deposit ejected by these streams has created shoals, banks, and flats, which have rendered the navigation of the bay somewhat intricate. There is here a Portuguese fort, on the left bank of English River, about 3 miles from its mouth, the southernmost establishment of that nation on the east coast of Africa, although they claim a territorial dominion as far as Point Natal. Delagoa Bay was originally called Lorenzo Marques, after its first discoverer, who was amongst the earliest of the Portuguese voyagers.

DELAINE, a muslin made originally of wool, afterwards more commonly of a mixed fabric, generally cotton and wool, and used chiefly as a printing cloth. See CALICO PRINTING.

DELAMBRE, JEAN BAPTISTE JOSEPH, one of the most distinguished modern astronomers, was born at Amiens in 1749, and studied under the Abbé Delille, who always remained his friend. He first applied himself to the languages, particularly most of the living ones, and made himself one of the best Hellenists in France. His studies were not directed to astronomy until his thirty-sixth year. He enriched the writings of Lalande with a commentary, and became the friend and pupil of the author, who proudly called him his *best work*. In 1790, eight years after the discovery of Uranus, Delambre published the tables of that planet, although in that period it had but performed a small part of its eighty years' course. He also constructed tables of Jupiter and Saturn, and of the satellites of Jupiter, which, with several treatises, procured him a reception into the National Institute. He was engaged with Méchain, from 1792 till 1799, in measuring an arc of the meridian from Barcelona to Dunkirk, for the verification of which he measured two bases of 6000 toises, one near Melun, the other near Perpignan. (See his Base du Système Métrique décimal, ou Mesure de l'Arc du Méridien compris entre les Parallèles de Dunkerque et Barcellone (Paris, three vols. 4to), and Recueil d'Observat. Géodésiques, faisant suite au 3me vol. de la Base du Syst. Métr. rédigé par Biot et Arago.) He was made member of the bureau des longitudes. In 1802 Napoleon appointed him inspecteur-général des études, which post he resigned when chosen perpetual secretary of the class of mathematical sciences (1803). His first tables of the sun were published in 1792; in 1806 appeared his new ones. In 1807 he succeeded Lalande in the Collége de France, and wrote his Traité d'Astronomie théorique et pratique (three vols. 4to, 1814), Histoire de l'Astronomie du moyen âge (1819), Hist. de l'Astron. moderne (1821), two vols.), and Hist. de l'Astron. du 18me Siècle (two vols.)—a collection of works such as no other nation can show. Delambre also distinguished himself as perpetual secretary of the Institute by the justice and elegance of his *éloges*. He died in 1822.

DELAROCHE, HIPPOLYTE (familiarly styled PAUL), a French painter, born in Paris in 1797, was the son of a valuator of objects of art at the Mont de Piété. He chose the profession of an artist, and turned his attention first to landscape-painting, but soon discovered that his genius did not lie in this department, and entered the studio of Baron Gros, where, eschewing alike the classic and romantic schools, he created for himself a peculiar style, which has been denominated the 'eclectic school of art.' He rapidly rose to eminence as one of the greatest of modern painters in France. His subjects are principally taken from French and English history. Among others may be mentioned, St. Vincent de Paul preaching before Louis XIII. on behalf of deserted children; Joan of Arc interrogated in Prison by Cardinal Beaufort; Flora Macdonald ministering to the Pretender after the Battle of Culloden; the Death of Queen Elizabeth, a work greatly admired by French and generally reprobated by English critics; A Scene of the St. Bartholomew Massacre; The Children of Edward IV. in the Tower; Cardinal Richelieu conducting Cinq Mars and De Thou up the Rhone to execution; Cromwell contemplating the dead body of Charles I., one of Delaroche's most exalted efforts; the Execution of Lady Jane Grey, and the Death of the Duke of Guise, both admirable pictures. What he considered, however, and not without some truth, as his *chef-d'œuvre*, was the pictorial decoration of the hemicycle of the Palais des Beaux Arts, on which he was engaged from 1837 to 1841. In this wonderful composition Delaroche has sought to illustrate the history of art from the remotest period to the present day, by representing, in one compartment, the great artists of all ages, painters, sculptors, and architects. Notwithstanding the number of persons depicted (upwards of eighty), and the diversities of figure and costume, the whole presents a group in perfect harmony, with a colouring at the same time quiet and rich, and a correctness of drawing which leaves nothing to be desired. It has often been objected to Delaroche that the accessories of his pictures are finished with such minuteness as to divert the attention from the main subject. His signal merits consist in correct drawing, brilliant and harmonious colour, and great distinctness and perspicuity in treatment, rendering the story of his pictures at once intelligible. His works are well known to the general public by engravings. He died at Paris on 4th November, 1856. At the sale of his pictures two new pieces appeared, Une Martyre au temps de Diocletien, and La Vierge chez les Saintes femmes le vendredi saint.

DELAVIGNE, Jean François Casimir, a French poet and dramatist, was born at Havre on 4th April, 1793, and educated at the Lycée Napoléon, Paris. In his earlier years he gave no special promise of future eminence, but about the age of fourteen began to make various attempts in poetry, and in 1811 composed a dithyrambic on the birth of the King of Rome, which attracted considerable attention, and procured him, from Count François de Nantes, a situation in the office of the Droits réunis, or indirect taxes, of which he was director. The emoluments derived from this, though small, were sufficient for his subsistence, without the duties being too onerous, and he was thus enabled to cultivate unrestrictedly his poetic talents. He competed on several occasions for the prize given annually by the French Academy; but of the poems thus presented, one only, L'Enseignement Mutuel, was successful. At the Restoration he published a set of elegies, entitled Les Messéniennes, which deplored the faded glories of France, and achieved an immense success. He now for the first time turned his attention to dramatic composition, and produced in 1819, at the Odéon, his tragedy of Les Vêpres Siciliennes, which was triumphantly received, and stimulated him to further efforts. The comedy of Les Comédiens appeared in 1820, and the tragedy of Le Paria in 1821, both successful pieces. Of his other plays which followed these may be mentioned more especially, L'École des Vieillards, in which the leading characters were sustained by Talma and Mdlle. Mars, and the literary merits of which procured its author the honour of admission as a member of the French Academy; Marino Faliero, a tragedy in five acts, represented in 1829; and the dramas of Louis XI.—founded on Commines' Memoirs and Quentin Durward—and Don Juan d'Autriche, produced, the former in 1832 and the latter in 1835. An English version of Louis XI. is well known to modern playgoers, from the admirable personation of the principal character by Mr. Charles Kean. Delavigne hailed the revolution of 1830 with enthusiasm, and composed on the occasion the celebrated chant of La Parisienne. The same year he married Mdlle. Eliza de Courtin. His health latterly gave way from severe literary toils, and with the view of re-establishing it he set out with his wife in the end of 1843 to try the genial climate of Italy. He was unable, however, to support the fatigues of the journey, and died at Lyons on 11th December. Delavigne is regarded by the French as one of the purest and most classical of their modern poets. His modest and amiable character rendered him a favourite with every one with whom he came in contact, while his private and domestic relations were most exemplary. A complete edition of his works, in six volumes 8vo, was published in 1846; another in 1854 in four vols. large 24mo.

DELAWARE, a river of the United States of America, which rises in Catskill Mountains in New York. In its course it separates Pennsylvania from New York and New Jersey, and New Jersey from Delaware, and loses itself in Delaware Bay, about 5 miles below Newcastle. It is navigable for vessels of the largest size to Philadelphia, 55 miles above the head of the bay, and about 120 from the ocean; for sloops to the head of the tide, at Trenton, 35 miles above Philadelphia; and for boats about 100 miles farther, though the boat navigation above Easton is very difficult. Its two most important tributaries are the Schuylkill and the Lehigh. The whole length from its source to the bay is about 300 miles. The principal towns on the Delaware, besides Philadelphia, are Burlington, Trenton, and Easton.

DELAWARE, one of the United States of North America, and, next to the state of Rhode Island, the smallest in the Union. It is bounded, north by Pennsylvania, east by the Delaware River and Bay and by the ocean, south and west by Maryland; area, 2120 square miles. It is divided into three counties, Kent, Newcastle, and Sussex. With the exception of a small rounded expanse in the north, it has the form of a right-angled triangle, with its base on the south, its perpendicular on the west, and its hypotenuse stretching from north-west to south-east along the bay. Delaware belongs geologically to the secondary formation intervening between the carboniferous and the cretaceous series. In the south, and towards the coast, the surface is very level; but the north part is rather hilly. An elevated swampy table-land towards the west traverses the state, forming the water-shed between the Bay of Chesapeake and the Delaware. The soil on this plateau is indifferent, but about the Delaware it is rich and productive. In the south the soil is sandy, but there is some fine grazing land. A cypress swamp on Indian River, 12 miles long by 6 miles broad, yields large quantities of timber. The chief crops are wheat, which, made into flour, forms a principal article of export; Indian-corn, rye, barley, oats, flax, buckwheat, potatoes, and peaches. Peach-growing is now one of the main industries of Delaware. In 1871, known as the champion peach year, 3,500,000 baskets were brought to market. The value of a basket is 30 to 40 cents. The climate is generally temperate and salubrious, but winter occasionally severe. The rivers of Delaware are small, and the sea coast, though of considerable extent, has no good natural harbours. Wilmington is the largest and most commercial town in the state. The capital is Dover. By the present constitution the governor is chosen for four years, and is ineligible ever after. The senate consists of three members from each county, elected for four years; the representatives are seven from each county, chosen for two years. Every male citizen above 22 years of age, after a year's residence, has the right of suffrage. Railway property is increasing in the state yearly, and a project was revived in 1871 of a ship canal to connect Chesapeake River and Delaware Bay.

Delaware derives its name from Lord Delaware, who died in his vessel while visiting it in 1610. It was settled by the Swedes and Finns as early as 1627. The colony was formed under the auspices of Gustavus Adolphus, king of Sweden, who named the country *Nova Suecia*. Hoarkill (now Lewistown) was founded in 1630, but the Dutch claiming the country, it passed under their power in 1655. In 1664 the colony on the Delaware fell, with other parts of New Amsterdam, into the hands of the English, and was granted by Charles II. to his brother James, duke of York, who, in 1682, conveyed it, as far as Cape Henlopen, to William Penn. In 1704 Delaware, though under the same proprietor, became a separate colonial establishment, and remained such until the revolution. Its constitution was formed in 1776, and amended in 1831. Pop. in 1870, 125,015—namely, white 102,221, coloured 22,794.

DELAWARE BAY, a large bay or arm of the sea, between the states of Delaware and New Jersey, formed by the mouth of the Delaware River and several other smaller ones. It is 65 miles long, and in the centre about 30 miles across, and about 15 at its mouth, from Cape Henlopen to Cape May. At the entrance to this bay, near Cape Henlopen, is situated the Delaware Breakwater, the object of which is to afford vessels a shelter within the cape. The breakwater proper is 1200 yards in length, and runs in a straight line from E.S.E. to W.N.W., leaving an entrance 650 yards wide between its east end and the north point of the cape. At the distance of 350 yards from the upper or western end of the break-

water (which space forms the upper entrance) a similar dyke, of 500 yards in length, is projected in a direct line, W. by S. ½ S., forming an angle of 146° 15′ with the breakwater. This work is designed more particularly as an ice-breaker. The whole length of the two dykes above described is 1700 yards, containing 900,000 cubic yards of stone, composed of pieces of basaltic rock and granite weighing from ¼ ton to 3 tons and upwards. The great objects gained by the construction of an artificial harbour in this roadstead are, to shelter vessels from the action of waves caused by the winds blowing from the E. to the N.W., round by the N., and also to protect them against injuries arising from floating ice descending the bay from the N.W. This great work was executed at the expense of the general government, and cost nearly £600,000.

DEL CREDERE, the Italian name for a guarantee commission, that is a commission charged by an agent for guaranteeing debts incurred by him in selling goods for his principal, or bills remitted in payment of debts collected by him. The term has come into general use in international commerce, and is recognized both in English and Scotch law.

DELEGATE. See DELEGATION.

DELEGATES, COURT OF, was so called because the judges thereof were delegated, by the king's commission under the great seal, to hear and determine appeals in the three following cases:—1. Where a sentence was given in any ecclesiastical cause, by the archbishop or his official; 2. When any sentence was given in any ecclesiastical cause in the places exempt; 3. When a sentence was given in the Admirals' Court, in suits civil and marine, by order of the civil law. This court has been abolished, and the privy-council is now the great court of appeal in all ecclesiastical causes.

DELEGATION, the investing with authority to act for another. Hence the name has been given to a body of persons thus deputed. Before the present constitution of the United States of America was adopted, the persons constituting the Congress at Philadelphia were called *delegates*, and the body of representatives of a state in Congress are still called the *delegation* of a state. In Maryland and Virginia the branch of the state legislatures which, in most of the other states, is called *house of representatives*, has the name of *house of delegates*. The name of *delegate* is also given to the representatives sent to the Congress of the United States from territories not yet formed into states. In Italy branches of government are often called *delegazione*, and their members *delegati*.

In the civil law *delegation* is that act by which a debtor transfers to another person the duty to pay, or a creditor transfers to another person the right to receive payment.

DELESSERT, BENJAMIN, was born at Lyons, Feb. 14, 1773, and was specially devoted to manufactures. In 1803 he started cotton-spinning in France, but he is particularly distinguished by his efforts to produce beet-root sugar. As early as 1801 he was engaged in refining, but in 1806 he began the experiments which were successfully terminated and announced to Chaptal on the 2d January, 1812. When he heard of it Napoleon was in ecstasies: 'We must see it: let us go,' he said. 'Delessert,' says Flourens, who narrates this incident, 'had just time to go to Passy, where his work was. On his arrival he found the gates surrounded by the imperial chasseurs, who refused him admittance. He told them who he was and entered. The emperor had seen and admired everything; excitement was at its height. Approaching Delessert, the emperor took the cross of the Legion of Honour from his own breast and gave it to him. It was announced next day in the Moniteur that a revolution in French commerce had been accomplished.' Delessert lived through the collapse which the manufacture suffered after Napoleon's fall, and long enough to see it revive and become of the greatest importance. He died March 1, 1847.

DELFT, formerly DELF, a town, Holland, province South Holland, 8 miles N.W. Rotterdam, supposed to be one of the oldest towns in the Netherlands. It stands on a dead flat, and is intersected in all directions by canals, which are crossed by sixty-nine bridges, mostly of stone. These canals make the great market-place with its public buildings an island, approached by nine bridges. The counterscarps of the old ramparts are now planted with trees, and form public walks such as are greatly prized by the Dutch. The town-hall (*Stadhuis*), in the great market-place, is a large, solid-looking building, with a heavy square tower rising from its roof. The Prinsen-hof, once the occasional residence of William I. of Orange, and the scene of his assassination, is now a military barrack. There are three Reformed churches. The old contains the monuments of Admirals Tromp and Hein, the famous naturalist Leeuwenhoek, and other worthies. The magnificent mausoleum of 'Father William,' and the burial-place of the Orange family, are in the new; and from the top of its huge square tower the town and neighbourhood are from time to time regaled with the richest music from a chime of three octaves; the new church contains also the tomb of Hugo Grotius. The third is called the hospital church. Delft has long been the seat of an arsenal, for which its central position fits it. In 1654 the powder magazine exploded accidentally, when not a single house entirely escaped, and many persons were killed or maimed. Pop. 22,280.

DELFT, the name of some celebrated Dutch painters, particularly of JAMES (born 1619, died 1661) and WILLIAM DELFT (towards the end of the sixteenth century). Both were born at Delft, were portrait-painters, and relations to the celebrated Mirevelt, also a native of this town.

DELFTSHAVEN, a small fortified town of Holland, on the Maese, 2 miles S.W. Rotterdam. It is well protected from inundation by dikes, &c., and has ample accommodation for shipping. Pop. 5424.

DELFT-WARE, or DELF-WARE, is a kind of pottery covered with an enamel or white glazing which gives it the appearance and neatness of porcelain. Some kinds of this enamelled pottery differ much from others, either in sustaining sudden heat without breaking, or in the beauty and regularity of their forms, of their enamel, and of the painting with which they are ornamented. In general the fine and beautiful enamelled ware, which approaches the nearest to porcelain in external appearance, is that which least resists a brisk fire. Again, those which sustain a sudden heat are coarse, and resemble common pottery. This kind of ware has its name from Delft, in Holland, where it is made in large quantities. See POTTERY.

DELHI, a city, Hindustan, presidency of Bengal, capital of a province of same name, and anciently of the Patan and Mogul Empires, lat. 28° 40′ N.; lon. 77° 16′ E.; about 700 miles N.E. Bombay, and about 790 miles N.W. Calcutta. It was at one time the largest city in Hindustan, covering a space of 20 square miles, and having a population of 2,000,000. It is now reduced to a circumference of 7 miles, and its population to about 160,000. A vast tract covered with the ruins of palaces, pavilions, baths, gardens, and mausoleums marks the extent of the ancient metropolis of the Mogul Empire. The present city, built on two rocky eminences is surrounded by walls of

red sandstone 30 feet high, and from 3 to 5 feet thick, with a moat 20 feet broad. There are seven colossal arched gates, defended by round bulwarks, and all built of freestone. The streets are all narrow, excepting two, which are, or rather were, of the breadths respectively of 30 and 40 yards, but now narrowed and otherwise disfigured by the intrusion of new buildings; one of them divides the city east to west, and is intersected by a canal or aqueduct. The houses here are of sandstone and brick, and are of two and three stories in height. The palace or residence of the Great Mogul, built by Shah Jehan, commenced in 1631, and finished in ten years, is by far the most interesting building in Delhi, from its being the most magnificent structure of the kind in India. It is situated on the bank of an offshoot from the Jumna, and is about 1½ mile in circuit, being inclosed by an embattled wall of reddish sandstone nearly 60 feet high, with round towers at intervals; the whole surrounded by a broad moat, which is separated from the streets of the city by a wide road or esplanade. There are two principal entrances—the Delhi and Lahore gates; both the most splendid buildings of the kind, particularly the former, which is probably not surpassed by any similar structure in the world. The main gateway is flanked by two massy angular towers, embattled to correspond with the top of the adjacent wall, and surmounted by two elegant octagon pavilions, with marble domes; the central portion of the building is considerably raised above the towers, in the form of an elaborately carved screen, supported on a double row of slender columns, with minarets at the ends; and over all seven small marble domes with gilt spires. The interior of the palace corresponds with the noble entrance, but from want of repair the walls in many places are fast tumbling down. One of the most remarkable objects in the city is the Jamma mosque, a magnificent structure in the Byzantine-Arabic style, and considered by the Mohammedans the wonder of the world. It stands upon an equilateral foundation, and is built of white marble and red sandstone, inlaid like mosaic, in lines and arabesques; at the two extreme corners rise minarets 150 feet high, and between them two lofty domes. This imposing edifice was built by the Emperor Shah Jehan, in the seventeenth century, and took several thousand men for six successive years (1631 to 1637) to complete it. There are no fewer than forty other mosques in different parts of the city, many of them having lofty minarets and gilded domes. There is here a college for the promotion of education amongst the natives of British India, the funds for the support of which are supplied chiefly by the Indian government. There is a separate department for English, Persian, Sanskrit, and Arabic. The average attendance is between 300 and 400, two-thirds of whom are Mohammedans, the remaining third being Hindus. The college is an elegant structure, and stands near the Ajmeer Gate. The famous observatory of Jye Singh, rajah of Jyepoor, at the south-west extremity of the city, has been much dilapidated, and its astronomical instruments nearly all destroyed or carried off. The principal manufactures of the town are cotton cloths, indigo, finely embroidered shawls, and jewelry, for which, as well as for delicately carved ivory, Delhi is somewhat noted. The chief imports are by the northern caravans, which bring from Cashmere and Cabul shawls, fruit, and horses. Precious stones of good quality are to be had at Delhi, particularly the large red and black carnelians. In the vicinity wheat, rice, millet, and indigo are grown.

Delhi, or as it was anciently called, Indraprastha, is mentioned by the Mohammedan historians as early as A.D. 1008, when it was the residence of the Hindu rajahs. It has at various times undergone great vicissitudes, having been frequently taken by hostile powers, and subjected to all the miseries of such events. In the beginning of the present century the prosperity of the city and country around was almost entirely annihilated, and the Mogul emperor and royal family reduced to the utmost poverty and distress, by the Mahrattas, who took possession of his capital, of his gardens and houses, and used his name to oppress and impoverish the people by fraud and extortion. From this miserable state of desolation and ruin the city was rescued by the British in 1803, when it was entered and taken possession of by Lord Lake. On the breaking out of the Indian mutiny in May, 1857, Delhi became the centre of the operations of the rebels, who flocked to it from all quarters. The nominal representative of the Great Mogul, who held the sovereignty of the place under British protection, joined cause with the rebels; and in addition to assuming the character of an independent potentate, gave his sanction to the massacres and atrocities perpetrated on the European residents. By the middle of June a British army under Generals Wilson and Nicholson was assembled in front of the city, and a siege commenced, which, from the smallness of the besieging force, was necessarily slow and protracted. It was brought to a successful termination on 20th September, when Delhi was entered by the British troops, and the nominal sovereignty heretofore possessed by the king was declared extinguished; and he himself, after being tried for the murders committed under his authority, was found guilty, and sentenced as a convict to transportation for life. A great part of the place was reduced to ruins in the mutiny and siege, but it has since recovered much of its former appearance, and has also been much improved in its sanitary condition.

DELILLE, JACQUES (also *Delisle*, *de Lille*), a French didactic poet, was born in 1738, at Aigueperse, in Auvergne. He resembled Pope (who was his model) in personal deformity, as well as in exquisite versification. In the College of Lisieux, at Paris, he distinguished himself by his precocious talents; and in the College of Amiens he began his metrical translation of Virgil's Georgics. He had translated this work by the end of his twenty-third year, but spent many years in retouching it. It was published in 1770, with a Discours préliminaire, and numerous annotations, which gave him also an honourable place among the French prose writers. Notwithstanding the jealousy of his rivals, Delille was invited to Paris, and was made professor at the Collége de la Marche, and afterwards at the Collége de France. In his thirty-seventh year he was received, on the recommendation of Voltaire, into the Academy. In 1782 he produced his didactic poem Les Jardins, ou l'Art d'embellir les Paysages. Shortly afterwards appeared one of his best known pieces, L'Imagination, and in 1803 he published his translation of Virgil's Æneid. Delille received the lower ordinations to be enabled to hold a benefice, from which, together with his salaries as professor and member of the Academy, and his own fortune, he derived, before the revolution, an annual income of 30,000 livres, of which he preserved at a later period only 600. He was also made a member of the National Institute. Though an adherent of the old system, Robespierre spared him on every occasion. At his request Delille wrote in twenty-four hours the Dithyrambe sur l'Immortalité de l'Ame, to be sung on the occasion of the public acknowledgment of the Deity. In 1794 he withdrew from Paris, and gave himself up to the sublime scenery of the Vosges, to meditation on the destiny of man, and on the laws of poetry. In Switzerland he finished his Homme des

Champs, a didactic poem on the charms of rural life, called also Géorgiques Françaises, which may be considered as a moral sequel to Virgil's Georgics. Delille laboured on it for twenty years, principally during the reign of terror, in the vales of the Vosges, in 1794 and 1795; hence the deep melancholy of many passages. The sufferings of his country produced Le Malheur et la Pitié, four cantos (Lond. 1803), full of lovely and touching pictures in harmonious verse. At London he married (1802) Mademoiselle Vaudchamps, for a long time the companion of his travels. Here he translated, in fifteen months, Milton's Paradise Lost, perhaps the most poetical of all his works; but the exertion brought on him a stroke of apoplexy. After his return to France he wrote his Trois Règnes de la Nature, and the admired poem La Conversation, a subject of which he was master. Its poetical character is the same as that of his other works. Lively feeling, richness of conception, animated descriptions, purity and great elegance of expression, harmonious and easy versification, are its chief excellencies. Bouterwek justly remarks, 'A didactic work like Delille's elegant Homme des Champs may have many charms of diction without being a poem.' He grew blind, and died on the 1st of May, 1813. He was universally lamented on account of his amiable character, as well as of his talents. After his death appeared Le Départ d'Eden (Paris).

DELIQUESCENCE, a change of form from the solid to the liquid state, by the absorption of moisture from the atmosphere. It occurs in many bodies, such as caustic potash, carbonate of potassium, acetate of potassium, chloride of calcium, chloride of copper, chloride of zinc, &c. &c. These and other salts similarly affected are called *deliquescent*, in contradistinction to others, such as sulphate of sodium, or Glauber's salts, which, instead of absorbing, give out moisture, and are therefore called *efflorescent*. The property of deliquescence fits the bodies which possess it for being employed to abstract moisture from the surrounding medium, and hence chloride of calcium is frequently used to dry gases which are the subject of experiment. The term deliquescence has been not unaptly extended to bodies which become liquid by absorption of certain vapours, though they may not be at all affected by moisture. This is the case, for example, with camphor, which remains quite solid in moist air, but if suspended in air containing alcohol vapour, it absorbs the alcohol and dissolves in it. Deliquescence indeed is merely one aspect of a general mutual attraction, existing not merely between solids and vapours, but between liquids and vapours, which exhibits itself in many curious ways, and is probably of greater importance in the economy of nature than at first sight appears.

DELIRIUM TREMENS, a nervous disease, produced by the excessive and protracted use of intoxicating drinks, and therefore almost peculiar to confirmed drunkards. Its name sufficiently indicates its peculiar symptoms—viz. delirium and trembling. It begins with excessive irritability, sleeplessness, frightful dreams, visions and delusions, and, if allowed to run its course, often ends in furious madness. The tremor, which is a usual, though not an invariable accompaniment, manifests itself chiefly in the hands. The removal of the immediate attack is often easily effected by the judicious administration of opium or other soporific medicines by which sleep is induced, and the irritability calmed. If sleep can be procured the patient is generally soon relieved. Sometimes, however, and more especially when the attack is not for the first time, but occurs after frequent recurrence, the delirium is succeeded by coma, and the patient dies with all the symptoms of apoplexy. The ultimate cure entirely depends on the strong resolution of the patient himself to abstain from intoxicating drinks, or the use, if necessary, of forcible means, making it impossible for him to obtain them.

DELISLE, or De L'Isle, William, a geographer, born at Paris, in 1675. He was instructed by Cassini, and soon conceived the idea of reforming the whole system of geography. He published, in his twenty-fifth year, a map of the world, maps of Europe, Asia, and Africa, a celestial and a terrestrial globe of a foot in diameter. By rejecting Ptolemy's statements of longitude, or rather by comparing them with the astronomical observations and the statements of modern travellers, he founded the modern system of geography. The number of his geographical maps of the old and new world amounts to 100. His last edition of his map of the world was published in 1724. These maps are valuable even at the present day. His brother Joseph Nicolas, born in 1688 at Paris, devoted himself in his earliest youth to astronomy, under the direction of Lieutaud and Cassini, and was admitted into the Academy of Sciences. His observations on the transit of Mercury over the sun, in 1723, and of the eclipse of the sun in 1724, increased his reputation. The Empress Catharine I. invited him to St. Petersburg, to establish a school for astronomy, to which the fame of Delisle soon gave celebrity. His leisure time was employed in travelling, for the purpose of making interesting collections in natural science and geography. On his return his collections were purchased by the king, and Delisle himself was appointed inspector of them. He continued his observations till his death, in 1768. The closing years of his life were spent in poverty and neglect, so much so that he was buried at the expense of his friends. Among his pupils were Lalande and Messier. His most important geographical work, Mémoires sur les nouvelles Découvertes au Nord de la Mer du Sud (1752), contains the results of the Russian voyages to discover a passage from the Pacific Ocean into the waters north of America. His Mémoires pour servir à l'Histoire et aux Progrès de l'Astronomie, &c. (1738), remain unfinished. His Avertissement aux Astronomes sur l'Eclipse annulaire du Soleil que l'on attend le 25 Juin, 1748, gives a complete history of all annular eclipses of the sun.

DELLA CRUSCANS. This term was applied to a coterie of English poetasters resident for some time in Florence, who, to while away their leisure hours, set to penning verses, which they published under the name of the Florence Miscellany. Notwithstanding the inconceivable silliness and affectation of these productions they found numerous admirers. One of the members of the society (named from the Academia Della Crusca in Florence), on his arrival in England, communicated the infection to minds of a like stamp, and the newspapers of the day, chiefly the World and the Oracle, began to give publicity to their lucubrations. Genuine poetry was at last at a discount, and nonsense and Della Crusca prevailed. The frenzy was however of short duration. The Baviad and Mæviad of William Gifford swept the butterfly Orlandos, Carlos, Lauras, Marias, 'and a thousand other nameless names' into merited oblivion.

DELOLME, Jean Louis, a writer on the English constitution, was born at Geneva in 1740. He at first practised as a lawyer in his native city, but the part which he took in its internal commotions, by a work entitled Examen des trois Points de Droit, obliged him to repair to England, where he passed some years in great indigence. He wrote for journals, frequented low taverns, was devoted to gaming and pleasure, and lived in such obscurity, that when he became known by his work on the English constitu-

tion, and some people of distinction were desirous of relieving him, it was impossible to discover his place of residence. His pride was gratified by this kind of low independence, and he rejected all assistance, excepting some aid from the Literary Fund, to enable him to return to his country. This was probably in 1775, since after that date he calls himself member of the Council of the Two Hundred in Geneva. At the time of his arrival in England aristocratical arrogance and turbulence had reached its highest pitch in Sweden and Poland, and it was feared that the same evils threatened England. Delolme entered into an investigation of this subject. Hence originated his famous work, Constitution de l'Angleterre, ou État du Gouvernement Anglais comparé avec la Forme républicaine et avec les autres Monarchies de l'Europe (Amsterdam, 1771); and a work in English, called A Parallel between the English Government and the former Government of Sweden (London, 1772). In both his principal object was to illustrate the excellence and stability of the English constitution, and this eulogistic character was no doubt one reason that led Lord Chatham, the Marquis of Camden, and Junius to speak so highly of the first-mentioned work. It is not a complete system of the political law of England, and has been reproached as being superficial; but it contains much ingenious reflection on the English constitution, on the energy arising from a happy union of royal power with popular liberty, and particularly on the value of an independent judiciary and the freedom of the press, subjected to penal laws, but not to a censorship. This work was translated by the author himself into English in 1772 (fourth English edition, 1784, with observations by Dr. Charles Coote). Delolme also published in English his History of the Flagellants, or Memorials of Human Superstition (1783, in 4to); an Essay on the Union with Scotland (London, 1796, 4to). He died in July, 1806, at a village in Switzerland.

DELORME, Marion, a celebrated beauty who reigned under Louis XIII. The date of her birth is stated at 1611, 1612, and 1615. Her beauty and wit soon made her house the rendezvous of all that was gallant and brilliant in Paris. The king, Cinq-Mars, Grammont, St. Evremond were among the number of her admirers. The leading spirits of the *Fronde* regularly assembled in her house, and she is said to have assisted them in their enterprises. Mazarin was about to have her arrested, when her sudden death terminated her short career of thirty-nine years. The legend is current in France that the death and funeral was a mere pretence, got up to permit her to make her escape. She is said to have crossed over to England, and married a rich lord, who shortly afterwards died. She then returned to France, married a chief of brigands, who had robbed her, but who was captivated by the charms of his victim. After the death of her second husband she married a procurator of finance in Franche-Comté, with whom she spent twenty-two years of her life. Upon his death all her share of prosperity forsook her. Plundered by adventurers and her own servants, she died in extreme poverty in 1706, or according to another story in 1741, at the age of 129 years. Victor Hugo has taken her as the subject of one of his dramas.

DELOS, called also, by the poets, *Cynthius*, *Pyrpile*, *Asteria*, and *Ortygia*, the central and smallest island of the Cyclades, in the Ægean Sea, the reputed birthplace of Apollo and Artemis or Diana. Delos, according to the poets, was once a naked rock floating about in the ocean, and was accidentally driven by the waves into the centre of the Cyclades. The Earth had promised Hera (Juno), with an oath, not to grant a resting-place to the fugitive Latona where she might be delivered. The unhappy woman wandered restlessly over the earth until she perceived the floating island. As this was not stationary, it was not comprehended in the oath of the Earth, and offered her an asylum. She vowed to build a temple on its rocks, to which all nations should bring offerings. On the rude cliffs, under a shadowing tree, Latona bore the infant gods Apollo (who was hence called *Delios*) and Artemis (who was called *Delia*). Both were, in after times, particularly worshipped on the island. Delos was thenceforward no longer the sport of the winds; it was moored to the bottom of the Ægean with adamantine chains by Zeus, and the fame of the isle spread over the world. Thus far mythological tradition.

At first the island, occupied by the Ionians, had kings of its own, who also held the sacerdotal office. In the course of time it came under the dominion of Athens. Nothing was tolerated upon it which bore the traces of death or war. The dead were buried in the adjacent island Rhenea. After the destruction of Corinth the rich Corinthians fled thither, and made Delos the seat of a flourishing commerce. The greatest curiosity of the island was the Temple of Apollo, whose oracle gave responses here during the summer, which were considered the most distinct and trustworthy. The temple, founded by Erisichthon, son of Cecrops, and embellished successively by different states of Greece, was built of Parian marble, and contained, besides the beautiful statue of the god, a remarkable altar, from which the *Delian problem*, as it is called, had its name. The inhabitants, having consulted the oracle concerning the remedy of a plague which raged in Delos, were ordered to double the altar of Apollo, which was a cube. This famous geometrical problem of the duplication of the cube was solved in different ways by several of the ancient mathematicians and philosophers. The Grecians celebrated the Delian festival here every five years; and the Athenians performed annually the beautiful pilgrimage called *theoria*, with processions and dances. Delos was held to be a place of so great a sanctity that the Persians, when they made war against Greece, forbore attacking the island out of reverence to the patron deities. Delos was celebrated in ancient times for the number and the excellence of its artists, and the school which it founded. Pliny says that its bronze was excellent and much esteemed. It was also celebrated for the fineness of its silver, which the Delians used with great skill and taste, in the formation of various utensils, vessels, statues of their gods, of heroes, animals, &c. The statue of Jupiter Tonans at Rome in the capitol, was of Delian bronze. Cicero, in his oration for Roscius, has many eulogiums upon the fine vases of Delos and Corinth. Delos, now called *Dili* or *Sdili*, is uninhabited, or is only the haunt of pirates; but splendid ruins of its former magnificence yet exist.

DELPHI, the seat of the most famous oracle of ancient Greece, was situated in Phocis, on the southern side of Parnassus. Apollo, according to fable, having killed the serpent Python, and determining to build his sanctuary here, perceived a merchant vessel from Crete sailing by. He immediately leaped into the sea in the form of an immense dolphin (Greek, *delphis*), took possession of the vessel, and forced it to pass by Pylos, and to enter the harbour of Crissa, not far from Delphi. After the Cretans had landed he assumed the figure of a beautiful youth, and told them that they must not return to their country, but should serve as priests in his temple. Inspired, and singing hymns, the Cretans followed the god to his sanctuary on the rocky declivity of Parnassus; but, discouraged by the sterility of the country, they implored Apollo to save them from famine and poverty. The god,

smiling, declared to them the advantage which they would derive from serving as his priests. They then built Delphi, calling the city at first *Pytho*, from the serpent which Apollo had killed at this place.

The oracles were delivered from a cave called *Pythium*. Tradition ascribes its discovery to a shepherd who pastured his flocks at the foot of Parnassus, and was filled with prophetic inspiration by the intoxicating vapour which arose from it. Over the cave, which was contained in a temple, was placed the holy tripod, upon which the priestess called *Pythia*, by whose mouth Apollo was to speak, received the vapours ascending from beneath, and with them the inspiration of the Delphian god, and proclaimed the oracles (hence the proverb, to speak *ex tripode*, used of obscure sentences, dogmatically pronounced). After having first bathed herself, and particularly her hair, in the neighbouring fountain of Castalia, and crowned her head with laurel, she seated herself on the tripod, which was also crowned with a wreath of the same, then, shaking the laurel tree, and eating perhaps some leaves of it, she was seized with a fit of enthusiasm. Her face changed colour, a shudder ran through her limbs, and cries and long protracted groans issued from her mouth. This excitement soon increased to fury. Her eyes sparkled, her mouth foamed, her hair stood on end, and, almost suffocated by the ascending vapour, the priests were obliged to retain the struggling priestess on her seat by force; then she began, with dreadful howlings, to pour forth detached words, which the priests collected with care, arranged them, and delivered them in writing to the inquirer. At first the answers were given in verse, but in later times, the authority of the oracle being diminished, they contented themselves with delivering them in prose.

This oracle was always obscure and ambiguous; yet it served, in earlier times, in the hands of the priests, to regulate and uphold the political, civil, and religious relations of Greece. It enjoyed the reputation of infallibility for a long time; for the Dorians, the first inhabitants of the place, who soon settled in all parts of Greece, spread an unbounded reverence for it. At first only one month in the year was assigned for the delivery of oracles; afterwards, one day in each month; but none who asked the god for counsel dared approach him without gifts. Hence the splendid temple possessed immense treasures, and the city was adorned with numerous statues and other works of art, the offerings of gratitude. Delphi was at the same time the bank in which the rich deposited their treasures, under the protection of Apollo, though this did not prevent it from being repeatedly plundered by the Greeks and barbarians.

The ancients believed Delphi to be the centre of the earth: this, they said, was determined by Jupiter, who let loose, from the east and from the west, two eagles, which met here. The tomb of Neoptolemus (or Pyrrhus), son of Achilles, was at Delphi, and near it the famous Lesche, adorned by Polygnotus with the history of the Trojan war. (See POLYGNOTUS.) In the plain between Delphi and Cirrha the Pythian games were celebrated, most probably in the spring. These national games, and the protection of the Amphictyons, gave Delphi a lasting splendour. It is now a village called *Castri*, near which may be seen the still flowing Castalian spring.

DELPHINI, IN USUM. See DAUPHIN.

DELPHINIUM. See LARKSPUR.

DELPHINUS (the *Dolphin*), a northern constellation of Ptolemy.

DELTA, Δ, a Greek letter answering to D. The resemblance of the island formed by the alluvion between the two mouths of the Nile to a Δ, is the reason why it was called by the Greeks *Delta*. It contained Sais, Pelusium, and Alexandria. It was divided into the Great and Small Delta. Islands at the mouths of other rivers shaped like a Δ have the same name. The largest are those of the Mississippi, the Ganges, the Rhone, the Danube, the Rhine, the Po. They occur where the waters of a sluggish stream meet those of the sea, and are checked by the tides, or in gulfs or inland seas where the tides are small. Where there are strong ebb-tides or oceanic currents, the accumulations brought down by the river are swept away.

DELUC, JEAN ANDRÉ, a geologist and meteorologist, was born in 1726, at Geneva, where his father was a watch-maker. He received an excellent education, and passed the first half of his life in commercial pursuits. During the many journeys which his business required him to make into the neighbouring countries, he made, with the assistance of his brother GUILLAUME ANTOINE, a splendid collection of objects of natural history. In 1773, obliged by commercial disaster to quit his native city, he came to England, where his reputation had preceded him. He was elected a fellow of the Royal Society of London, and appointed reader to the queen, a situation he held for forty-four years. He made numerous geological excursions in central Europe and in England, of which he has published accounts. He died in 1817 at Windsor. He enriched science with very important discoveries. His theories and hypotheses, which he endeavoured to accommodate to the historical accounts contained in the Holy Scriptures, have met with violent opponents. Among his numerous writings are his Recherches sur les Modifications de l'Atmosphère (Geneva, 1772, two vols. 4to); Nouvelles Idées sur la Météorologie (London, 1786, two vols.); and his Traité élémentaire de Géologie (Paris, 1810, 8vo).

DELUGE (from the Latin *diluvies*, *diluvium*, from *diluere*, to wash away), the universal inundation, which, according to the Mosaic history, took place to punish the great iniquity of mankind. It was produced, according to Genesis, by a rain of forty days, and a breaking up of 'the fountains of the great deep;' and covered the earth 15 cubits above the tops of the highest mountains, and killed every living creature, except Noah, with his family, and the animals which entered the ark by the command of God. After the flood had prevailed upon the earth 150 days, and had decreased for an equal time, making its whole duration somewhat less than a year, Noah became convinced that the land had again emerged by the return of a dove with an olive branch, and landed on Mount Ararat, in Armenia. The time when this chastisement took place was, according to the common computation, in the 1656th year of the world; according to Petavius, 2327 B.C.; according to Müller, 3547 B.C. Many other nations mention, in the mythological part of their history, inundations, which, in their essential particulars, agree with the scriptural account of Noah's preservation. Hence many persons have inferred the universality of this inundation. To this it has been replied that each nation localizes the chief events and actors as connected with itself, necessitating an Ararat, an ark, and a Noah in each instance. Fohi in the Chinese mythology, Sottivrata or Satyavrata in the Indian, Xisuthrus in the Chaldæan, Ogyges and Deucalion in the Greek, have each been recognized by many as the Noah of the Sacred Scriptures under a different name. Even the American Indians have a tradition of a similar deluge, and a renewal of the human race from the family of one individual. All these individuals are said by their respective nations to have been saved, and to have become a second father of mankind.

DEMAGOGUE (Greek, *demagogos*), one who leads or directs the people in political matters. In its original acceptation it was considered an honourable designation, and in this sense Pericles was a demagogue. On the other hand, the tanner Cleon, satirized by Aristophanes in his play of the Knights, is a portrait of the personage to whom the epithet in its bad sense is applied. It is a handy nickname to throw at a popular politician with whose views you have no sympathy.

DEMAND AND SUPPLY, in political economy, the desire for services or utilities on the one hand, and the production or offer of them on the other, which tend to complete an act of exchange. Demand is commonly said to be relative to supply, but in reality it is reciprocal to it. Certain political economists qualify the term *demand* by the word *effectual*, but it is scarcely necessary to make such a limitation. A mere desire for objects has no commercial significance, but that desire simply which contemplates a mutual benefit. Thus the wish of a beggar to possess a diamond cannot affect the price of the article, as he can offer no desirable object in return. The intensity of demand, and the consequent effect upon values, will be proportionate to the necessity which exists for satisfying the demand. Different rules, therefore, will apply to the increase of price consequent upon increased demand and reduced supply in articles of voluntary use, and to the same rise in price when affecting articles of necessary use. The demand for the latter class of utilities is constant, and a deficiency in supply cannot be met by abstinence, except to a scarcely appreciable degree, whereas any considerable deficiency in the supply of articles of voluntary use is to some extent met by economy. Prices will, therefore, increase in different ratios according to the degree in which the commodities demanded are necessary or convenient. Thus the price of grain may rise, in the case of a bad harvest, from 50 to 100 per cent.; cotton or wool, in similar circumstances, would certainly fluctuate, but not to anything like the same extent; wine would vary in price least of all; the deficiency in the last two commodities being artificially restored by the decrease of demand consequent on economy and abstinence.

DEMARATUS, of the second branch of Spartan kings, succeeded his presumed father Ariston about B.C. 510; but lost the throne, partly in consequence of a quarrel with his colleague Cleomenes, and partly on account of doubts which had been cast upon his real parentage. He retired into private life; but having afterwards become a magistrate, was sitting in that capacity at the Gymnopædian games when Leotychides, who had supplanted him as king, sent tauntingly to ask him how he felt in a secondary place after having occupied the first. The boldness and menacing nature of his reply forced him to take flight, and he passed over into Asia, where he was well received by Darius, and became possessed of considerable estates. He accompanied Xerxes on his expedition against Greece, and is said to have given counsel which, if listened to, would probably have made the issue of it very different from what it eventually proved. He died in Persia, leaving a numerous posterity, who long held a high rank in the country.

DEMAVEND, a volcanic mountain of Persia, and the highest peak of the Elbruz chain, 45 miles south of the Caspian Sea, and about 40 miles north-east of Teheran. Its height has been variously stated at from 18,549 to 21,520 feet. At a distance the mountain has the form of a smooth cone, and appears to slope evenly from top to bottom at an angle of 45°. The cone terminates in a crater of 85 yards in diameter, and nearly surrounded by jagged rocks, composed partly of basalt and partly of limestone and sulphur. The basin within is almost entirely filled with snow. Around the base are many hot springs.

DEMBEA, a large lake of Abyssinia, in a province of the same name in the west part of that country. It is supposed to be 150 miles in circumference, is over 6000 feet above the level of the sea, and contains many islands, one of which is a place of confinement for state prisoners. The Bahr-el-Azrek, the Abyssinian Nile, flows through it.

DEMBINSKI, HENRYK, a Polish general, and leader in the Hungarian revolution of 1849; born 1791, at Strzalkow, in the Palatinate of Cracow. He served under Napoleon during the Russian campaign of 1812, distinguished himself at the battle of Leipzig; returned to his native land in 1815, and devoted himself to agriculture with considerable success. In the year 1825 he became a member of the Polish diet, where he cast in his lot with the opposition party. On the outbreak of the revolution in that country (1830), he was made brigadier-general, and in the following year was nominated governor of Warsaw and commander-in-chief of the Polish army. On the fall of Warsaw in September into the hands of the Russians, Dembinski made his escape into Prussia; then resided for a considerable period in France. The Hungarian revolution of 1849 once more offered him a field for his activity, and he was appointed by Kossuth commander of the insurgent troops. He had the misfortune to lose the battle of Kapolna (28th February), and resigned his command. He consented to act under Görgei. After the capitulation signed by the latter at Villagos (13th Aug.), and the resignation of Kossuth, Dembinski fled to Turkey. In the following year he returned to France, where he remained until his death, which took place at Paris, 13th June, 1864.

DEMERARA, or DEMARARA, a province of British Guiana, which derives its name from the river Demarara or Demerara (which see). It originally belonged to the Dutch, and was ceded to Great Britain in 1814. It extends about 100 miles along the coast, lying on the east of Essequibo, and on the west of Berbice. The soil is very fertile, producing abundant crops of sugar, coffee, cotton, rice, &c. The climate resembles that of South Carolina. For 20 miles up the river the country consists of extensive meadows, and is perfectly level; then appear some sand-hills; afterwards the country becomes mountainous and broken. Chief town, Georgetown. Pop. of province, 85,000.

DEMERARA, a river of South America, in British Guiana, which, after a course of about 120 miles, flows into the Atlantic, lon. 58° 12′ W.; lat. 6° 48′ N. It is 2 miles wide at its mouth, and is navigable for ships of considerable burden nearly 100 miles. It affords an excellent harbour, but the bar will not admit vessels drawing more than 18 feet.

DEMESNE. See DOMAIN.

DEMETER, one of the twelve principal Grecian deities, the great mother-goddess, the nourishing and fertilizing principle of nature. She was the daughter of Cronos and Rhea, and mother of Persephonê (often called *Cora*, the Maiden, the Proserpine of Roman mythology), and, according to Hesiod, of Dionysus (Bacchus). By later writers Demeter is represented as being the wife of Dionysus. The main feature in the mythus of Demeter, and that which forms the fundamental idea of her worship, is the loss and recovery of her daughter, Persephonê. Zeus, without the knowledge of Demeter, had promised Persephonê to Pluto, who carried her off as the earth opened in a field where Zeus had caused some flowers to grow to tempt the unsuspecting maid. Her mother, who heard the echo of her cries, but did

not see who had carried her away, sought for her in vain over the earth, till Helios told her that Pluto had carried her off with the connivance of Zeus. Demeter vowed never to return to Olympus until her daughter accompanied her. Zeus sent first Iris, and then all the gods, to implore her to return, but without success; at last, fearing lest the race of mortals should perish, she having afflicted the earth with sterility, he despatched Hermes to Erebus to bring back Persephonê. Pluto consented to her return, but gave her a pomegranate, and she having eaten of the fruit of Erebus, was compelled thenceforth to spend a part of every year in the infernal regions. Hermes conducted her to her mother at Eleusis, and Zeus sent Rhea to urge Demeter to revisit Olympus, and tell her that he had consented that Persephonê should remain two-thirds of the year with her mother, the remaining third (the winter season) being passed with Pluto. Demeter now consented to return and to restore fertility to the earth; but before departing from Eleusis, which she had made her abode, she taught Triptolemus how her worship was to be conducted, and initiated him into the mysteries of the Eleusinia. In ancient monuments Demeter is represented as a beautiful matronly woman, with a mild and benevolent expression of face; she is always enveloped with ample drapery, which is usually close up to the neck; sometimes, however, one of her breasts is left exposed. Professor Max Müller identifies her with the Sanskrit *Dyârâ Mâtar* (the Dawn). By the Romans she was called *Ceres*.

DEMETRIUS, or DMITRI, a series of impostors who usurped supreme authority in Russia, and led to some of its remarkable revolutions. Ivan Wasiliewitch, who had put his eldest son to death with his own hand, left the throne in 1584 to another son, Fedor, a feeble prince, whom Boris Godunow entirely supplanted in his authority. Ivan had left another son, Dmitri, by a second marriage; and Boris, fearing that he might one day prove a formidable obstacle to his ambitious projects, made away with him, but no one exactly knew how. The report was that he had been murdered in the town of Uglitz, and that in the tumult caused by the atrocity the body disappeared, and the murderers were slain. Shortly after, in 1598, Fedor died, and Boris took possession of the throne. A degree of mystery still hung over the fate of Dmitri, and Grishka, or Gregory Otrepieff, who is said to have been of a noble family, determined to turn it to account. Having learned to read and write, and acquired some other branches of education, then rare accomplishments in Russia, he became secretary to the Greek patriarch Job. Several persons had been struck with his resemblance to Dmitri, and he at once explained the fact by declaring that he was Dmitri indeed, and that the design of Boris to murder him had been frustrated by the substitution of another boy in his stead. The report quickly spread among the people, and Otrepieff, to escape the pursuit of Boris, fled into Poland, where George Mniszek, palatine or waiwod of Sandomir, gave him an asylum, and ultimately became so convinced of the justice of his claim, that he promised him his daughter in marriage, and introduced him to Sigismund III., king of Poland, who saw in him a useful instrument for introducing Polish influence into Russia, and so aided him to enter that kingdom at the head of a body of troops. Boris marched against him, but was deserted by his soldiers, and ended his life by poison. Otrepieff in 1605 entered Moscow in triumph, and, as the genuine son of Ivan, was proclaimed Grand-duke of Russia. It is even said that Ivan's widow, who was still alive, had an interview with him, and, either from conviction or some unexplained connivance at the imposture, acknowledged him for her son. He was now firmly seated on the throne, and might have transmitted it to his descendants had he governed with prudence. But he offended the Russians by his attachment to Polish manners and customs, and still more by a want of respect to the Greek religion and its patriarch, and it was determined to confer the sovereignty on Basil Suszki, a descendant of the ancient czars in the female line. Meanwhile the daughter of the Palatine of Sandomir arrived, and a pompous celebration of the nuptials had commenced, when the conspirators, after exciting a tumult, forced their way into the palace and put the false Dmitri to death. His body was exposed to public view, but in such a state that its features could not be recognized; and a rumour of his being still alive having spread, another impostor quickly appeared to personify him. It is not easy to understand how he could do it with success, but the palatine's daughter doubtless greatly contributed to it by acknowledging him to be her husband. Suszki maintained his ground for some time by the assistance of the King of Sweden, but the Poles espoused the cause of the second false Dmitri, and had made it triumphant, when he was assassinated in 1610 by the Tartars whom he had selected as his body-guards. A state of anarchy ensued, and continued for nearly half a century, during which a number of other false Dmitri appeared in different quarters. A detailed account of the fortunes of these adventurers would be almost entirely devoid of interest.

DEMETRIUS I., surnamed *Poliorcetes* (the conqueror of cities), king of Macedonia, son of Antigonus, waged several wars, in particular with Ptolemy Lagus. He appeared before Athens with a fleet, expelled Demetrius Phalereus, who had been appointed governor of the place by Cassander, and restored to the people their ancient form of government (307 B.C.) Having lost the battle of Ipsus against Seleucus, Cassander, and Lysimachus (301 B.C.), he fled to Ephesus, and thence to Athens, where he was not permitted to enter. Passing over to Corinth, he embarked on an expedition against the Thracian dominions of Lysimachus. He then went to Asia, to bestow his daughter Stratonice in marriage on Seleucus, and on his way took possession of Cilicia, by which his friendship with Seleucus was broken off. He conquered Macedonia (294 B.C.), and reigned seven years, but lost this country by his arbitrary conduct. Deserted by his soldiers, he surrendered himself at length to his son-in-law, who exiled him to Pella, in Syria, where he died (284 B.C.) at the age of 54 years.

DEMETRIUS PHALEREUS, mentioned above, a celebrated Greek orator, disciple of Theophrastus, devoted his first years to rhetoric and philosophy, but towards the end of the reign of Alexander the Great entered into the career of politics. He was made Macedonian governor of Athens, and archon (309 B.C.), and embellished the city by magnificent edifices. The gratitude of the Athenians, over whom he ruled, erected him as many statues as there are days in the year, but these were afterwards scornfully broken, and he himself condemned to death by that fickle people. He fled to Egypt, to the court of the Ptolemies, where he is said to have promoted the establishment of the Alexandrian Library, and of the museum, the superintendence of which Ptolemy Lagus intrusted to him. Under the following king, Ptolemy Philadelphus, he fell into disgrace, and was banished to a remote fortress, where he died from the bite of an asp. Demetrius was among the most learned of the Peripatetics, and wrote on several subjects of philosophical and political science. But the work on rhetoric, which has come to us under his name, belongs to a later age.

DEMI-LUNE, in fortification, is a work constructed to cover or protect the curtain or wall of a place, and the shoulders of the neighbouring bastions. It is composed of two faces forming a salient angle towards the open country outside the place. It has two demi-gorges formed near the counterscarp, and is surrounded by a ditch.

DEMI-MONDE, an expression first used by the younger Dumas in a drama of the same name (first performed in 1855), to denote that class of gay female adventurers who differ from honest women in being the objects of public scandal, and from courtesans by their non-venality. When the word is used elsewhere than in France the last-mentioned difference is seldom kept in mind.

DEMISE (literally, a *laying down*), a grant by lease; it is applied to an estate either in fee-simple, fee-tail, or for a term of life or years. The word *demise* in a lease implies an absolute covenant on the part of the lessor for the lessee's peaceable enjoyment during the term. As applied to the crown of England, *demise* signifies its transmission to the next heir on being laid down by the sovereign. 'So tender is the law of supposing even a possibility of the sovereign's death, that his natural dissolution is called his demise, an expression which merely signifies a transfer of property' (Blackstone).

DEMISEMIQUAVER, in music, half a semiquaver, or the thirty-second part of a semibreve.

DEMIURGE (Greek, *demiourgos*, a handicraftsman), a designation applied by Plato and other philosophers to the Divine Being, considered as the Architect or Creator of the universe. The Gnostics made a distinction between the Demiurge and the Supreme Being; with them the first is the Jehovah of the Jews, who, though deserving to be honoured as the Creator, was only the instrument of the Most High. This is simply an identification of the Platonic *Logos* with the second person in the Trinity.

DEMMIN, a town of Prussia, province of Pomerania, in the government of and 70 miles W.N.W. from Stettin, in a valley surrounded by hills, at the confluence of the Tollense and Trebel with the Peene. It is a place of considerable antiquity, having been walled and fortified during the twelfth century, and consists of the town proper and three suburbs. It has manufactures of woollen and linen cloth, hats, leather, hosiery, and tobacco; and carries on a trade in corn, malt, and wood. Demmin was a place of greater consequence previous to the Thirty Years' war, in which it suffered severely. Pop. 9050.

DEMOCRACY. See GOVERNMENT.

DEMOCRITUS, a philosopher of the new Eleatic school, a native of Abdera, who flourished in the 72d olympiad, and was born between 470 and 460 B.C. Some Magi and Chaldeans, whom Xerxes left on his return from his Grecian expedition, are said to have excited in Democritus the first inclination for philosophy. After the death of his father he travelled to Egypt, where he studied geometry, and probably visited other countries, to extend his knowledge of nature. Among the Greek philosophers he enjoyed the instruction of Leucippus. He afterwards returned to his native city, where he was placed at the head of public affairs. Indignant at the follies of the Abderites, he resigned his office, and retired to solitude, to devote himself exclusively to philosophical studies.

We pass over the fables which have been related of Democritus, such as that he laughed continually at the follies of mankind (in contrast to the weeping Heraclitus), and give a short summary of his philosophical opinions. In his system he developed still further the mechanical or atomical theory of his master Leucippus. Thus he explained the origin of the world by the eternal motion of an infinite number of invisible and indivisible bodies, atoms, which differ from one another in form, position, and arrangement, and are alternately separated and combined by their motions in infinite space. In this way the universe was formed, fortuitously, without the interposition of a First Cause. Although thus denying the presence of *design* in nature, he admitted that of *law*. He called the common notion of *chance* a cover of human ignorance, the refuge of those who are too idle to think. The eternal existence of atoms (of matter in general) he inferred from the consideration that time could be conceived only as eternal and without beginning. Their indivisibility he attempted to prove in the following manner:—If bodies are infinitely divisible, it must be allowed that their division must be perceptible. After the division has been made, there remains either something extended, or points without any extent, or nothing. In the first case, division would not be finished; in the second case, the combination of points without extension could never produce something extended, and if there remained nothing, the material world would also be nothing; consequently, there must exist simple, indivisible bodies (atoms). From his position of the eternal change of the separating and combining atoms, follows also the other, that there are numberless worlds continually arising and perishing. In the atoms he distinguished figure, size, gravity, and impenetrability. All things have the same elementary parts, and their difference depends only on the different figure, order, and situation of the atoms, of which everything is composed. This difference of the atoms is infinite, like their number; hence the variety of things is infinitely great. Fire consists, according to him, of active globules, and spreads, like a light envelope, round the earth. The air is moved by the continual rising of the atoms from the lower regions, and becomes a rapid stream, which carries along with it the stars formed in its bosom. The soul consists, in as far as it is a moving power, of the finest fire-atoms; but since it is acquainted with the other elements, and anything can be known only by its equal, it must be composed in part also from the other elements. The sense of feeling is the fundamental sense, and the least deceitful of all; for that alone can be true and real in the objects, which belongs to the atoms themselves, and this we learn with the greatest certainty by our feeling. The other senses show more the accidental qualities of things, and are consequently less to be relied upon. The impressions produced on the five senses are effected, partly by the different composition of the atoms in the organs of sense, partly by the different influence exerted by external bodies, which varies with the arrangement of the atoms of which they consist. In the act of vision images separate from the external body, and enter the eye. The motion of a body (for instance, of the lips in speaking) divides the air, and gives it a motion, varying according to the direction of the moving body. The parts of air thus put in motion arrive at the ear, and produce hearing. In a similar way arise the sensations of tasting and smelling. The images of the objects received by the eye arrive through it to the soul, and produce within us notions. If, therefore, no notions come to the soul by means of the eye, its activity ceases, as is the case in sleep. The knowledge conveyed by the senses is obscure and deceitful, and represents mere motions of the exterior bodies. What we know by the way of reason has a higher degree of certainty, yet it is not beyond doubt. The continuation of the soul after death was denied by Democritus, who believed it to be composed of atoms. He divided it into two parts: into the

rational part, which has its seat in the breast; and the sensual part, which is diffused through the whole body. Both constitute only one substance. He applied his atomical theory, also, to natural philosophy and astronomy. Even the gods he considered to have arisen from atoms, and to be perishable like the rest of things existing. In his ethical philosophy Democritus considered the acquisition of peace of mind as the highest aim of existence. The purest joy and the truest happiness are only the fruit of the higher mental activity exerted in the endeavour to understand the nature of things, of the peace of mind arising from good actions, and of a clear conscience.

Democritus is said to have written a great deal; of which, however, nothing has come to us except a few fragments, and these refer more to ethics than to physical matters. He died 370 B.C., at an advanced age. His school was supplanted by that of Epicurus.

DEMOISELLE. See CRANE.

DEMOIVRE, ABRAHAM, a mathematician of the last century. He was a native of Vitry, in Champagne, and was driven from his native country by the revocation of the edict of Nantes. He settled in London, and gained a livelihood by becoming a teacher of mathematics. He was particularly celebrated for his skill and accuracy as a calculator, whence he is thus referred to by Pope:—

'Sure as Demoivre, without rule or line.'

He died in 1754, at the age of eighty-six. His works are, Miscellanea Analytica, 4to; The Doctrine of Chances, or a Method of Calculating the Probabilities of Events at Play, 4to; and a work on Annuities; besides Papers in the Transactions of the Royal Society, of which he was a fellow.

DEMON (Greek, *daimon*), a name given by the ancients to a spirit supposed to hold an intermediate place between men and the celestial deities. In Homer we find the term *daimon* sometimes applied to one or other of the gods; but it is commonly used by him in a general sense, as when we speak of 'the Deity' or 'Providence.' Daimon is probably derived from *daiō*, to divide or distribute, though some look upon it as equivalent to *daemon*, intelligent or wise. Hesiod uses *daimon* in a different sense from Homer. He admitted four classes of rational beings—gods, demons, heroes, and men. A strict classification was not made until the popular belief had been introduced into the schools of the philosophers. Aristotle divides the immortals into gods and demons: the mortals into heroes and men. In the Greek philosophy these demons early played an important part. Thales and Pythagoras, Socrates and Xenophon, Empedocles and the Stoics, invented many fictions concerning them, each in his own way. The poetic Plato, however, goes further than any of the others. In The Banquet the character of the demons is thus explained: 'Demons are intermediate between God and mortals; their function is to interpret and convey to the gods what comes from men, and to men what comes from the gods; the prayers and offerings of the one, and the commands of the others. These demons are the source of all prophecy, and of the art of the priests, in relation to sacrifices, consecrations, conjurations, &c.; for God has no immediate intercourse with men, but all the intercourse and conversation between the gods and mortals is carried on by means of the demons, both in waking and in sleeping. There are many kinds of such demons or spirits.' In other places he says of them, they are clothed with air, wander over heaven, hover over the stars, and abide on the earth; they behold unveiled the secrets of the time to come, and regulate events according to their pleasure; every mortal receives at birth a particular demon, who accompanies him until his end, and conducts his soul to the place of purification and punishment. Later writers divided them, in reference to the effects ascribed to them, into good and bad spirits—Agathodemons and Cacodemons. The Romans still further developed the Greek demonology; with less, however, of a poetical character, and mixed with Etruscan notions.

We perceive in all this the original idea: wherever an inexplicable power operates in nature, there exists some demon. This idea was developed by the philosophers, who endeavoured to regulate the popular belief, and to reconcile reason with this belief. In order to represent the idea of deity in its purity they were compelled to displace, by degrees, the mythological notions of the people; and this could not be done in a less perceptible and obnoxious way than by the introduction of demons. But although Greek philosophers did this for Greece, we must not believe that these ideas, like the word *demon*, are of Greek origin. It is much more credible that the whole doctrine of demons was only transplanted into Greece. Its fullest and most systematic development is found in Buddhism, which recognizes six classes of beings in the universe, two only of which, those of men and angels, are good; the other four—the Asuras, irrational animals, Pretas or goblins, and the denizens of hell—are evil. The Asuras are the most powerful of the wicked spirits, and are at constant war with the gods (Devas). They dwell beneath the three-pronged root of the world-mountain, occupying the nadir; while their great enemy, Indra, the highest Buddhist god, sits upon the pinnacle of the mountain in the zenith. With the Asuras are associated numerous groups, as the Rakshasas, gigantic opponents of the gods, terrible ogres with bloody tongues and long tusks eager to devour human beings, and lurking in fields and forests; the Nagas, snakes with human faces; the Mahoragas, great dragons; the Pikatshas or Vampires, &c. According to their nature and office, the different species of demons dwell in the air, the water, or the earth, in holes, dens, or clefts.

In order to explain the origin of evil Zoroaster adopted, besides a good principle, a bad one also, and made the two the sources of all good and evil, explaining his ideas thus: There is a kingdom of light, and a kingdom of darkness. Ormuzd (Ahuramazda), the author of all good, resides in the first; in the other, Ahriman (Angromainyus), the source of all evil, moral as well as physical. Around the throne of Ormuzd stand the seven Amshaspands (archangels), the princes of light. The Izeds, the genii of all that is good, of whatever kind, are subordinate to them; and to these the Fervers. In the same way the kingdom of darkness under Ahriman is arranged. His throne is surrounded by the seven superior Devs, the princes of evil, and an innumerable multitude of inferior Devs stand under them, like the Izeds under the Amshaspands. The two kingdoms carry on a steady war; but Ahriman will eventually be conquered, purified, and forgiven, and the kingdom of darkness will be entirely destroyed. Heeren endeavoured to show that these systems are formed according to the constitutions of the Asiatic monarchies, but all evidently modified according to the place where, and the circumstances of the time at which, the lawgiver and founder of religion appeared. Zoroaster carried his general idea of the division between the kingdoms of good and evil into detail. All rational and irrational, living and dead beings, he classed under one or the other of these kingdoms; the pure men, animals, and plants, belonged to Ormuzd's, the impure (poisonous, pernicious) to Ahriman's kingdom. In this manner demonology, in the Parsee system, had attained an extent and a systematical connection such as it had not elsewhere.

The opinion of Horn (Biblische Gnosis) that the Egyptians borrowed their notion of demons from the Parsees deserves a closer investigation. We find, indeed, with the Egyptians, the moon, water, earth, and air filled with demons superintending the elements and bodies. Stones, metals, and plants are under their influence, and human souls in their power—surely a very extensive kingdom of demons, but not presenting the striking dualism and parallelism of the system of Zoroaster. But supposing that the Egyptian and Persico-Chaldee demonologies are not derived from the same source, they afterwards combined to form together a new one. Though the doctrine of demons came in different ways through Western Asia into Greece, yet Egypt was the chief source of the higher demonology of the Greeks, among whom it was spread by the Orphic hymns and the mysteries, and was cultivated by the philosophers until the birth of Christ.

The rationalists, as they are called, who explain everything in the Sacred Scriptures so as to exclude the miraculous, say that, while it came in this way to the Greeks, the Hebrews received it in two other ways. At the time of the Babylonish captivity they derived it from a Chaldaic-Persian source; and even supposing that they were previously acquainted with the Elohim, or angels, it is remarkable that the latter are first mentioned in the history of the Chaldee Abraham, and that the earlier prophets do not speak at all of them, while Daniel, on the contrary, mentions them frequently; yet the doctrine of these was first systematically developed during and after the Babylonish captivity. The same dualism which we find in the system of Zoroaster is here also perceived: there are good and bad demons; they are classified, and receive proper names. There are also seven good demons composing the council of Jehovah, and standing continually before his throne. Job xii. 15.

As for the second source of the demonology of the Hebrews, this nation had, during the reigns of the Seleucides and Ptolemies, a more active intercourse with Egypt and the Greeks, chiefly in Alexandria; and to the notions adopted from the system of the Magi, or the Parsees, they united Egyptico-Greek ones. It was impossible to prevent the intermingling of Greek speculations. The voice of the prophets had become silent under Ezra and Nehemiah. Study and inquiries commenced; the popular belief and philosophy separated, and even the philosophers divided themselves into several sects. Opposed to the ancient Pharisees we perceive the Sadducees and Essenes, and no high-priest nor sanhedrim could prevent the nation (which was already opposed by the Samaritans) from dividing itself into parties. Pythagorean and Platonic notions intermingled with oriental doctrines, and a cabalism existed in addition to the philosophy of the rabbins.

However much the first teachers of Christianity participated in the beliefs of their fellow-countrymen respecting the doctrine of spirits, there can be no doubt but that their successors, the fathers of the church, were considerably influenced by the popular ideas on this subject. It did not readily occur to the Jew or early Christian to deny the existence of the gods of the heathen nations; the plan was adopted of transforming them into devils. We thus find in literature up till the middle ages, and even on this side of them, the divinities of oriental, classical, and Scandinavian mythology figuring as princes of hell. Even at the present day, among the imaginative, the companion-demon of the Greeks has a counterpart in the guardian angel, or the white and black spirits ever present prompting to good or evil. See ANGEL and GENII.

DEMONIAC, a person whose mental faculties are overpowered, and whose body is possessed and actuated by some created spiritual being. It is generally agreed that spirits are not known to exert at present such an influence over the human race, but in ancient times evil spirits were believed to have been much more active in this respect. An opinion now current, that all persons spoken of in the New Testament as possessed of devils were precisely in the same condition as the madmen, hypochondriacs, and epileptics of modern times, has been met with something like the following argument. All the teachings of revelation and the conjectures of human reason concerning the existence of spiritual beings is consistent with and favourable to the doctrine of demoniacal possession. It was generally believed throughout the ancient world, Jew as well as Gentile; it is mentioned in the New Testament in such language that the Gospels cannot well be regarded in any other light than a series of impostures, and Christ must be looked upon as a man who took advantage of the ignorant credulity of his contemporaries, if this doctrine be but a vulgar error.

On the other hand, it is argued that the universality of a belief is not proof of its correctness; that to permit evil spirits to intermeddle with the concerns of human life would destroy the sense of human responsibility, and would break through the order which God appears to have established throughout all His works, introducing an amount of confusion unworthy of the wisdom of Divine Providence. See on this and the subject of the preceding article Sir Walter Scott's Demonology and Witchcraft; Ukert, Ueber Dämonen, Heroen und Genien (Leipzig, 1850).

DEMONSTRATION, in military language, a movement towards any place for the purpose of deceiving the enemy and concealing the true design.

DEMONSTRATION, which, according to its etymology, simply means 'showing or pointing out,' was originally used in this extensive sense and applied to any mode of connecting a conclusion with its premises, or an effect with its cause. In a more rigorous sense it is applied only to those modes of proof in which the conclusion necessarily follows from the premises, and the rejection of the conclusion, therefore, always involves a contradiction. In what is called probable evidence, the certainty attained varies in its degrees from mere presumption up to complete moral conviction, unaccompanied with any shadow of doubt; but in demonstrative evidence there are no degrees, and the proposition affirmed must be either absolutely true or absolutely false. The great domain of demonstration is mathematics, in which all the proofs, however complicated, are drawn from a few simple axioms, founded on intuitive perceptions of number, time, and space. In ordinary language, however, demonstration is often used as synonymous with *proof*, and sometimes even more loosely as synonymous with *explanation* and *exhibition*, as when we speak of anatomical demonstration.

DEMONTE, a town, North Italy, on the Stura, 14 miles S.W. from Coni. It has a communal college, three churches, an hospital, and a theatre. It has thermal springs, iron, cotton, and coarse woollen manufactures, and a silk-mill. The town is commanded by a fort built on a neighbouring height. Pop. over 6000.

DE MORGAN, AUGUSTUS, was born at Madura, in Southern India, in June, 1806. He was sent to England while but a child, and entered Cambridge at so early an age that before he had completed his twenty-first year he had gained the fourth place in the mathematical tripos of 1827, and taken his B.A. degree. In 1828 he was appointed professor of mathematics in the University College, or as it was then

called, London University—a situation which he held until 1866, with the exception of the five years from 1831 to 1836. Previous to this appointment he had turned his mathematical attainments to account in the service of some of the London assurance companies, and continued throughout his life the confidential adviser of some of the most important of these associations. More than a year before his death, which occurred in March, 1871, paralysis inflicted on his vigorous intellect a blow from which it never rallied. The following are the titles of a few of his works: Elements of Arithmetic (1830); Elements of Algebra (1835); Elements of Trigonometry (1837); Essay on Probabilities and on their Application to Life Contingencies and Insurance Offices (1838); Formal Logic (1847). Professor De Morgan was also an extensive contributor to the Penny Cyclopædia and to several leading periodicals of the time.

DEMOSTHENES, the most famous orator of antiquity, was the son of a sword-cutler at Athens, where he was born in 382 (according to some in 385) B.C. His father left him a considerable fortune, of which his guardians attempted to defraud him. Demosthenes, at the age of seventeen years, conducted a suit against them himself, and gained his cause. He studied rhetoric under Isæus, and benefited in some degree from the teachings of Isocrates and Plato. But nature had placed great obstacles in his way, and his first attempts to speak in public were attended with derision. He not only had very weak lungs and a shrill voice, but was unable to pronounce the letter *r*. These natural defects he endeavoured to remedy by the greatest exertions. He succeeded by the advice of the actor Satyrus, who advised him to recite with pebbles in his mouth, on the roughest and steepest places. To strengthen his voice he exercised himself in speaking aloud on the sea-shore, amidst the noise of the waves. At other times he shut himself up for months in a subterranean room, with his head half-shaved, that he might not be tempted to go out, and endeavoured to acquire dignity of manner by practising before a mirror. He is also said to have transcribed the history of Thucydides eight times for the purpose of forming his style. After such a laborious preparation he composed and delivered his masterly speeches, of which his enemies said that they smelt of the lamp, but to which posterity has assigned the first rank among the models of eloquence—speeches in which he openly opposed the foolish wishes of the multitude, censured their faults, and inflamed their courage, their sense of honour, and their patriotism. He thundered against Philip of Macedon in his orations known as the *Philippics*, and instilled into his fellow-citizens the hatred which animated his own bosom. The first Philippic was delivered in 352 B.C., when Philip could no longer conceal his ambitious scheme of subjugating the whole of Greece. In 349 the city of Olynthus, the northern ally of Athens, was captured and destroyed by the Macedonians, and shortly afterwards Philip took possession of the Pass of Thermopylæ. The orator insisted on the necessity of immediately preparing a fleet and an army; urging the Athenians to begin the war themselves; to make Macedonia the theatre, and to terminate it only by an advantageous treaty or a decisive battle. They admired and approved his plans, but did not execute them. The celebrated Phocion, who knew the weakness of Athens, unceasingly advised peace. Demosthenes went twice to the court of Philip to negotiate, but without success. On his return he recommended war, and endeavoured to arm not only Athens, but all Greece. When Philip had finally penetrated into Phocis, through the Pass of Thermopylæ, and had taken possession of the city of Elatea (338), to the terror of Athens, Demosthenes obtained a decree of the people for fitting out a fleet of 200 vessels, marching an army to Eleusis, and sending ambassadors to all the cities of Greece, for the purpose of forming a universal confederacy against Philip. He was himself among the ambassadors, and prevailed on the Thebans to receive an Athenian army within their walls. He also exerted himself actively throughout Bœotia, and by his efforts a numerous army was collected to act against Philip. A battle was fought near Cheronea, and the Greeks were vanquished. Demosthenes fled, like thousands more. Nevertheless he was desirous of delivering a funeral oration over those who had fallen in battle. Æschines, his rival, did not fail to attack him on this account. The hostility between the two orators was the occasion of the speech De Corona (on the crown), which resulted in the triumph of Demosthenes and the exile of his adversary. Philip having been soon after assassinated, Demosthenes endeavoured to rouse Athens to regain her independence, but Alexander's dreadful chastisement of her ally Thebes filled the Athenians with such terror that they sued for mercy. It was with difficulty that Alexander could be persuaded to desist from his demand of the surrender of Demosthenes and some other orators; for the Macedonians feared Demosthenes more than they did the armies of Athens. He was afterwards fined fifty talents on a charge of bribery, and being unable to pay the fine, was thrown into prison, from which he escaped and fled to Ægina, where he remained till the death of Alexander. Then followed the war with Antipater. Demosthenes again appeared in public, and endeavoured to persuade the small Grecian states to unite against Macedonia. The Athenians received him with honour; but the war was unsuccessful, and Antipater insisted upon his being surrendered to him. Demosthenes fled to the Temple of Poseidon, in the Island of Calauria, on the coast of Argolis, but finding himself not secure, he took poison, which he always carried about with him. He died, according to the general account, in 322 B.C., at the age of sixty or sixty-two years.

The character of Demosthenes is by most modern scholars considered almost spotless. Cicero pronounces him to be the most perfect of all orators. He always spoke as circumstances required, and was by turns calm, vehement, or elevated. He carried the Greek language to a degree of perfection which it never before had reached. In energy and power of persuasion, in penetration and power of reasoning, in the adaptation of the parts to the whole, in beauty and vigour of expression, in strong and melodious language, he surpassed all his predecessors. Everything in his speeches is natural, vigorous, concise, symmetrical. This alone can explain his great influence over his contemporaries. We have under his name sixty-one orations, fifty-six exordiums, and six letters, some of which are not genuine. Among the oldest editions of the orations the best is that of Paris, 1570, in folio, with the commentaries of Ulpian. The first edition of his complete works, Greek and Latin, was edited by Hieronymus Wolf (Basel, 1549; reprinted 1572; and Frankfort, 1604, in folio). His orations are also contained in Reiske's edition of the Greek orators. The edition by Bekker (Leipzig, 1855) is considered among the best of the modern ones; the translated edition in Bohn's Classical Library contains besides much historical and other interesting matter.

DEMOTIC (or ENCHORIAL) ALPHABET, from the Greek *demos*, the people, is the name given by antiquarians to that alphabet which is used by the people, in contradistinction to an alphabet used by a certain class or caste; as, for instance, among the Egyptians. We find on the famous Rosetta stone

three inscriptions, one in hieroglyphics, one in demotic characters, and one in Greek. According to Champollion the demotic is a simplification of the hieratic, which again was a contraction of the hieroglyphic characters. According to Wilkinson the oldest inscriptions in demotic writing only date from the era of the Ptolemies. The hieroglyphic writing was a mixture of figurative, symbolic, and phonetic characters; the demotic for the most part is made up of the latter.

DEMOTICOS, or DIMOTIKA, a town, Turkey in Europe, province of Roumèlia, on the right bank of the Maritza, 20 miles south from Adrianople; pop. about 8000. The town has some silk, woollen, and earthenware manufactures. It is the see of a Greek archbishop, and is defended by a citadel, containing a palace, in which several of the Turkish sultans resided before they gained possession of Constantinople. Charles XII. remained here for some time after the disaster of Pultowa.

DEMPSTER, THOMAS, a learned Scotsman, author of numerous works on history, law, and archæology, was born in 1579 at Brechin, in Forfarshire, according to others in Aberdeenshire, and studied at Aberdeen and Cambridge. In France, whither he went at an early period of his life, he represented himself as a man of family (assuming the title of Baron of Muiresk), and possessed of a good estate, which he had abandoned for his religion, the Roman Catholic. He was promoted to a professor's chair at Paris, in the College of Beauvais. Bayle says that though his business was only to teach a school, he was as ready to draw his sword as his pen, and as quarrelsome as if he had been a duellist by profession; scarcely a day passed, he adds, in which he did not fight either with his sword or at fisticuffs, so that he was the terror of all the schoolmasters. He at last involved himself in a dispute, which obliged him to flee to England. How long he remained, or in what manner he was employed there, is uncertain; but he married a woman of uncommon beauty, with whom he returned to the Continent. Crossing the Alps he obtained a professor's chair in the University of Pisa, with a handsome salary attached to it. Here his comfort, and perhaps his usefulness, was marred by the conduct of his beautiful wife, who at length eloped with one of his scholars. Previously to this, we suppose, for the time is by no means clearly stated, he had been professor in the University of Nismes, which he obtained by an honourable competition in a public dispute upon a passage of Virgil. Driven from Pisa by the infidelity of his wife, he obtained a professorship at Bologna, which he held till his death, in the year 1625.

Dempster's works are very numerous, and they exhibit proofs of great erudition. Among them his Historia Ecclesiastica Gentis Scotorum is the most remarkable, though, instead of being, as its title would indicate, an ecclesiastical history of Scotland, it is merely a list of Scottish authors and Scottish saints. The work was composed in Italy, where, it is presumable, the works of Scottish authors were not easily accessible, in consequence of which he could not be expected to proceed with any very great degree of accuracy; but many of his errors, it must be candidly admitted, are not the result of inadvertency, but of a studied intention to mislead. Of the names which he so splendidly emblazons a large proportion are wholly fictitious. The work was reprinted for the Bannatyne Club in 1829. His really most valuable work is De Etruria Regali, an edition of which was published at Florence in 1725, two vols. folio.

DEMULCENTS, medicines which tend to soothe or protect the mucous membranes against irritants, to promote the dilution of the blood, or to increase the secretions. They are generally composed of starch, gum, albuminous or oily substances largely diluted.

DEMURRAGE, in mercantile law, is used to signify the amount to be paid by the charterer to the owner of a ship for detaining her in port longer than the time specified. The time of delay in port for a cargo, for convoy, &c., is usually stipulated in the charter-party, and also the allowance to be made in case of longer delay for those objects; and this time is sometimes specified in working days or lay days, as distinguished from holy days, when no cargo can be put on board. All ordinary cases of detention, such as port regulations, the overcrowded state of the harbour, and the like, or even from the unlawful acts of the custom-house officers, are at the freighter's risk, and demurrage must be paid although it is proved that the delay was not caused by any fault of his. But demurrage cannot be claimed when the ship is detained by a public enemy or by the hostile occupation of the port, nor if the detention is caused by the owner, master, or crew. The claim ceases whenever the vessel is cleared and ready for sailing, though she should be detained by adverse winds or rough weather. When a charter-party, made in England, relates to a delay in the river Thames for a certain number of days, it will, in pursuance of a particular custom, be construed to mean working days. But if the charter-party be made elsewhere, or, if made in England, relating to a demurrage at any other place, if the intention is that it should allow a certain number of working days, it ought to be so expressed.

DEMURRER, a pause or stop put to the proceedings of an action upon a point of difficulty, which must be determined by the court before any further proceedings can be had therein. He that demurs in law confesses the facts to be true, as stated by the opposite party, but denies that, by the law arising upon those facts, any injury is done to the party, or that he has made out a lawful excuse.

DEMY, a certain size of paper. A sheet of printing demy measures 22 inches by 17½, writing paper 22 by 15½, and drawing paper 22 by 17.

DEN (Saxon, valley, or woody ground), when added to the names of places, denotes that they are in a valley, or near woods.

DENAIN, a town, France, department of Nord, 6 miles from Valenciennes, on the left bank of the Scheldt, which is here navigable. It stands in the centre of a coal-field, and has rapidly risen into importance, having now a pop. of 11,022, though in 1826 it was only 900. Both coal and iron are extensively raised, and supply several blast-furnaces and other iron-works on the spot. Denain had once a celebrated abbey, founded in 764. A great victory was gained here in 1712 by the French under Villars over the allies under Eugene and Albemarle.

DENARIUS.—1. A Roman silver coin, equal at first to ten asses, whence its name, but afterwards considered equal to eighteen asses when the weight of the latter coin was reduced to one ounce. Its value in English money was about 7¾*d.* or 8*d.* There was also a gold denarius, which was worth twenty-five silver denarii. The silver denarius was coined for the first time five years before the first Punic war (B.C. 269).—2. A weight. The *libra*, or Roman pound, contained ninety-six, the ounce eight, *denarii*, and the *denarius* three scruples.

DENBIGH, a maritime county, North Wales, bounded N. by the Irish Sea, E. by Flint, Chester, and Salop, W. by Carnarvon, S. by Montgomery and Merioneth; greatest length, 48 miles; greatest breadth, about 28 miles; area, 392,005 acres. Its

surface is much diversified. Towards the north there are some level tracts, but its general character is that of a rugged and mountainous country, redeemed by several beautiful and fertile vales; amongst the more celebrated of which are the vales of Llangollen, Clwyd, Conway, and Valle Crucis. The east part of the county is inclosed by a range of rugged hills, commencing near St. Asaph's, the loftiest summit of which is 1845 feet above the sea; another range incloses the county on the south-west, attaining an elevation of 1660 feet. Heath and ling is the general covering of these hills, whose dreary wastes are interspersed with numerous small lakes and streams. Black-cattle, sheep, and goats are reared in great numbers in the hilly districts. Barley, oats, and potatoes are grown on the uplands; and in the rich valleys wheat, beans, and pease. In the south and east parts of the country dairy-husbandry is carried on to a considerable extent, and cheese produced equal to that of Cheshire. The climate is salubrious, but in districts exposed to the north winds somewhat rigorous, although in the valleys it is sufficiently mild. The minerals consist of lead, iron, coal, freestone, slate, and millstone. In the hilly districts there are immense quantities of peat, so close-grained as to exhibit a polished surface when dry, and cut with a sharp instrument. Flannels, coarse cloths, and stockings are manufactured to a considerable extent. The principal rivers are the Clwyd, the Dee, and the Conway. These three rivers are the chief channels through which its surplus waters are drained; but it has no river navigation, nor any seaport. The projecting point or headland called Great Ormes Head, at the entrance into the Menai Strait, is in this county. The Chester and Holyhead Railway passes through it in a line parallel with, and close to the sea coast. The county is divided into six cantrefs or hundreds, and fifty-seven parishes. It returns three members to Parliament; two for the county, and one for the borough of Denbigh. Pop. in 1861, 100,778; in 1871, 104,266.

DENBIGH, a town and parliamentary borough, North Wales, capital of the above county, near the centre of the Vale of Clwyd, 22 miles west of Chester, and 180 miles N.W. London, picturesquely situated on a rocky eminence, the summit of which is crowned by the ruins of an ancient castle. The town, which consists of one principal and several subordinate streets, extends down the slope of the hill and some way round its base. The market-hall is a spacious building in the Elizabethan style. There are here a free grammar-school, founded in 1727, a mechanics' institution, and a splendid lunatic asylum capable of accommodating 200 patients. Tanning and shoemaking are carried on, the latter being the principal trade in the town, and occupying between 400 and 500 hands. Woollen plaids, linsey-woolseys, and waistcoat pieces are also manufactured in considerable quantities. Denbigh was made a borough in the time of Edward I. It sends one member to Parliament in conjunction with Holt, Ruthin, and Wrexham. Denbigh, in the reigns of the Edwards, was, with its fortress, bestowed on various individuals, at different times, as a special mark of royal favour. In 1646 it was taken and dismantled by the parliamentary troops; and after the Restoration it was blown up with gunpowder, and rendered completely untenable. Pop. 6323.

DENDERAH (the *Tentyra* of the Greeks and Romans), a ruined town of Upper Egypt, on the left bank of the Nile, lat. 26° 10′ N.; lon. 32° 40′ E., celebrated for its temple, the most magnificent and best preserved of any of the remains of antiquity in Egypt. The town stands on a plain surrounded by mountains, and beautified by palm-trees. About the distance of 1½ mile east are the ruins of the Temple of Isis. They are nearly all inclosed within a wall built of sun-dried bricks, in some parts 35 feet high and 15 feet thick. The gateway which leads to the temple is a singularly beautiful specimen of Egyptian architecture and sculpture; it is 42 feet in height, 33 feet in width, and 17 feet in depth, and is covered with hieroglyphs and ornaments, elegantly designed and exquisitely cut. The portico of the temple consists of twenty-four columns, in three rows, each above 22 feet in circumference, 32 feet high, and covered with hieroglyphs. The interior consists of several apartments, all the walls and ceilings of which are covered with religious and astronomical representations, including the figure of Isis, the presiding deity of the place, which is very frequently repeated. The roofs are flat, and are formed of oblong masses of stone resting on the side walls, or on rows of columns carried down the middle of the apartment, and whose capitals are richly ornamented with the budding lotus. The only light admitted to the interior was by small perpendicular holes cut in the ceiling, or by oblique apertures in the sides. It was thus exceedingly dark and gloomy, but well calculated for the mysterious religious rites of which it was the scene. The most remarkable object, however, belonging to the temple, and that which has excited the greatest interest, is a mythological table, resembling a celestial planisphere or zodiac, sculptured on a kind of sandstone, and forming the ceiling of one of the upper chambers. It occupied the central space of three concentric circles, and appeared as if supported by twelve figures, four of which are females. These are standing, while the eight male figures, which have hawks' heads, are represented kneeling. The zodiac, as it is called, was carefully removed from its original place in 1822, and conveyed to France, and is now in the museum at Paris. It has formed a fertile source of discussion among antiquaries, great differences of opinion existing as to what it is, and of what age.

DENDERMONDE, or TERMONDE, a town, Belgium, province of East Flanders, at the confluence of the Dender with the Scheldt, here crossed by a large bridge, 12 miles N.W. from Brussels, on the railway from Malines to Ghent. It is strongly fortified and defended by a citadel dating from 1584, and surrounded by low marshy ground which can be laid under water. It contains four churches, a town-house, a courthouse, a lunatic and orphan asylum, a refuge for the aged, a prison, two arsenals, and barracks. It is also the seat of a court of first resort, of a chamber of commerce, and a *conseil-de-prud'-hommes;* possesses a college, a public library, an academy of design and architecture, a musical society, &c.; and has manufactures of woollen stuffs, cotton covers, tulle, hats, linen, tobacco, soap, oil, chloride of lime, salt, ropes, leather, and mustard, for which last the town is famous. There are also salt refineries, dyeworks, bleach-fields, breweries, and distilleries; and an important trade in oil, corn, hemp, flax, and linen. Dendermonde is not mentioned in any existing record before the eleventh century. It afterwards became the capital of a lordship of same name, which extended north to Durme and west to near Ghent. In 1667 Louis XIV. besieged it with 50,000 men, but the garrison opened the sluices and he was forced to retire after being nearly drowned. When afterwards besieged by Marlborough, in 1706, a drought of seven weeks rendered the same defence unavailing, and the town was soon compelled to make an unconditional surrender. Pop. over 8600.

DENDRITES, or ARBORIZATIONS, an appellation given to figures of vegetables, observed in fossil substances, and which are of two kinds, superficial and

internal. The former are chiefly found on the surface of stones, and between the strata and the fissures of those of a calcareous nature. They are mostly brown, changing gradually to reddish yellow. The internal dendrites are of different colours. The most esteemed sorts are those found in agates, and particularly in the sardonyx, cornelian, and other precious stones brought from the East, and which are commonly denominated *Moka stones*. The figures are very often due to the infiltration of manganese oxide, as in the dendritic specimens from Tinto in Lanarkshire. The name is also applied to the moss-like aggregations of copper, silver, and other metals which occur native and can be made artificially. In these varieties the forms are due to crystallization. Sometimes little brown mossy specks are to be seen on paper. These appear to be dendritic copper. See DIANA'S TREE.

DENGUE FEVER. See FEVER.

DENHAM, DIXON, lieutenant-colonel, well known by his expedition into Central Africa, was born at London in 1786, and after finishing his studies at school was placed with a solicitor, but in 1811 entered the army as a volunteer, and served in the Peninsular campaigns. After the general peace he was reduced to half-pay on the peace establishment, and in 1819 was admitted into the senior department of the Royal Military College at Farnham. In 1823–24 he was engaged, in company with Captain Clapperton and Dr. Oudney, in exploring the central regions of Africa. (For an account of their expeditions, see CLAPPERTON.) His courage, address, firmness, perseverance, and moderation, his bold, frank, energetic disposition, and his conciliating manners, peculiarly fitted him for such an undertaking. The narrative of the discoveries of the travellers was prepared by Denham, and published shortly after his return in 1824. In 1826 he went to Sierra Leone as superintendent of the liberated Africans, and in 1828 was appointed lieutenant-governor of the colony; but on the 9th of June of the same year he died of fever, after an illness of a few days.

DENHAM, SIR JOHN, a poet, born at Dublin in 1615, was the son of Sir John Denham, chief baron of the exchequer in Ireland. He was educated in London and at Oxford. Although dissipated and irregular at the university, he passed his examination for a bachelor's degree, and then removed to Lincoln's Inn to study law. In 1641 he first became known by his tragedy of The Sophy. This piece was so much admired that Waller observed, 'Denham had broken out like the Irish rebellion, 60,000 strong, when no person suspected it.' At the commencement of the civil war he received a military command; but not liking a soldier's life, he gave it up, and attended the court at Oxford, where, in 1643, he published the first edition of his most celebrated poem, called Cooper's Hill. He was subsequently intrusted with several confidential missions by the king's party, one of which was to collect pecuniary aid from the Scottish residents in Poland. He returned to England in 1652; but how he employed himself until the Restoration does not appear. Upon that event he obtained the office of surveyor of the king's buildings, and was created a knight of the Bath, and a fellow of the newly formed Royal Society. A second marriage, at an advanced age, caused him much disquiet, and temporary mental derangement; but he recovered, and retained the esteem of the lettered and the courtly until his death in 1688, when his remains were interred in Westminster Abbey. Among the last and best of his productions is a poem in which he commemorated the death of Cowley. His poetry generally is remarkable for its rhythmic flow and smoothness, leading up sometimes to passages of force and dignity.

DENINA, CARLO GIOVANNI MARIA, an Italian historian, born in 1731, at Revello, in Piedmont, studied belles-lettres at Turin, and received the professorship of humanity at the Royal School at Pignerolo. When the chair of rhetoric at the Superior College of Turin was vacant, Denina was made professor in the college and university. He now published the three first volumes of his History of the Italian Revolutions (Turin, 1769, three vols. quarto), containing a general history of Italy, which subjected him to some inconveniences, by exciting the ill-will of the defenders of the privileges of the clergy. In 1777 he travelled, on account of his health, to Rome, made a stay at Florence, received an invitation to Prussia, went to Berlin in September, 1782, was presented to Frederick the Great by the Marquis Lucchesini, and appointed a member of the Academy, with a salary of 1200 Prussian dollars. He had several conversations with Frederick, an account of whose life and reign he afterwards wrote. He also published La Prusse littéraire sous Frédéric II. (three volumes). In 1791 he made a journey to Piedmont, and published, on his return to Berlin, the Guide littéraire. Most of his works were written at Berlin; as, for instance, his history of Piedmont and of the other Sardinian States, Political and Literary History of Greece; and Letters from Brandenburg. After the battle of Marengo, the council of administration appointed him librarian at the University of Turin. Before he entered upon this office he wrote his Clef des Langues, which he dedicated to Napoleon, then first consul. He received in return an honourable letter, and a gold snuff-box, through Duroc. This favour was followed by the offer of the place of librarian to the emperor, upon which he repaired to Paris. He died in 1813.

DENIS (Latin, *Dionysius*), ST., the apostle of the Gauls. He set out from Rome on his sacred mission towards the middle of the third century, preaching at Arles and several other places on his route. He was the first bishop of Paris, and many conversions to the faith are set down to his credit. He and two of his colleagues, Rusticus a priest, and Eleutherus a deacon, refusing to recant, were put to death by order of the Roman governor Pescennius. His body was transferred to the abbey which afterwards bore his name, which is situated at about 6 miles from Paris. The legend has it that the three martyrs had their heads struck off on a hill near Paris, which took the name of the Mount of the Martyrs (Montmartre). After having been beheaded, the saint rose up, picked up his head, marched with it between his hands for a distance of 3 miles, angels surrounding him all the way, chanting glorias and hallelujahs. A permanent halt was made at the place where the abbey was erected. Catulla, a heathen lady, impressed by the sacred character and sufferings of the saint, had his body buried in her garden, became a Christian, and erected a small chapel over his tomb, which was afterwards rebuilt by St. Geneviève. (See DENIS (ST.), ABBEY OF.) The profane will have it, however, that the abbey was built on the site of a Pagan temple dedicated to Bacchus in the ordinary terms *Dionyso Rustico Eleuthero*.

DENIS, ST., a town in France, in the department of the Seine, 6 miles north of Paris, lying within the lines of forts surrounding the capital. The town is built on the Seine, the Crould, and the Rouillons, and has clean spacious streets. Of late years St. Denis has greatly increased in population and importance, partly owing to the influx of Parisians, who found the expense of living in the capital too great. It has numerous manufactories of calicoes and other printed cotton goods, gelatine, candles, saltpetre, soda, and other chemical products. There are besides, tanneries,

breweries, bleacheries, and flour-mills. There is an active trade in flour, wine, timber, and wool. Pop. 26,117.

DENIS, or DENYS (ST.), ABBEY OF, a French church celebrated in history. This large edifice is still standing, a noble structure, built in the twelfth and thirteenth centuries. The *portail*, or great door frontage, is of the former date. It is ornamented with statues of the olden saints and French kings, carved in stone. The interior of the church was once sumptuously enriched with pious offerings and works of art. In the large vaults under the choir reposed the remains of several kings of the first and second races, and all the rulers of the third race, from Hugh Capet to Louis XV. inclusive. The vaults are nearly vacant, the bodies having been removed during the first revolution. Oct. 16, 1793, at the time when the queen was beheaded in Paris, the coffin of Louis XV. was taken out of the vaults of St. Denis, and after a stormy debate it was decided to throw the remains of all the kings, even those of Henry IV. and Louis XIV., which were yet, in a good degree, preserved entire, and recognized with perfect certainty, into a pit—to melt down their leaden coffins on the spot, and to take away and melt into bullets whatever lead there was besides in the church (the whole roof, for example). Napoleon's decree of the 20th February, 1806, made St. Denis again the burial-place of the reigning family of France; the church was repaired and ornamented, and marked with the emblems of the new dynasty, particularly the large N. Napoleon had selected a vaulted room for the tomb of himself and his consort. Louis XVIII. obliterated from St. Denis all traces of Napoleon's rule, buried whatever bones of his ancestors could be found, especially the relics of Louis XVI. and his family, in the ancient sepulchre of the kings, and instituted canons, whose duty it is to protect the tombs within. The canons of St. Denis were the most distinguished in France, and formed a convent, the abbot of which was a bishop.

DENIZEN. In England a denizen is an alien born, who has obtained letters patent whereby he is constituted a British subject. A denizen is in a middle state between an alien and a natural born or naturalized subject, partaking of the nature of both. He may take lands by purchase, or derive a title by descent through his parents or any ancestor, though they be aliens. By the 33 Vict. cap. xiv. it is now, however, provided that 'real or personal property of every description can be taken, acquired, held, and disposed of by an alien in the same manner in all respects as a natural born subject.' No denizen can sit in either house of Parliament, or have any office of trust, civil or military.

DENMARK (Danish, *Danmark*), a northern kingdom of Europe (capital, Copenhagen), between lat. 54° 40′ and 57° 45′ N., and lon. 8° 4′ and 12° 45′ E. It is composed of a peninsular portion, and an extensive archipelago, lying east of it, with a few scattered islands on its west side; and is bounded N. by the Skager Rack, which separates it from Norway; N.E. and E. by the Kattegat and Sound, which separate it from Sweden; E. and S. by the Baltic; S. by the Duchy of Schleswig; and W. by the German Ocean or North Sea. The peninsular portion is composed of Jutland, and measures, north to south, 185 miles, with a breadth varying from 40 miles to 108 miles—its broadest part being from Fornaes Point, lat. 56° 26′ 42″ N., on the east coast, to Nissum Fiord on the west coast. The numerous islands lying east of Jutland are mainly comprised in two groups:—first, that of Seeland or Zealand, including, besides the large island of that name, the small adjoining islands east of the Great Belt, the principal of which are Amager, Langöe, Taröe, Masnedöe, Agersöe, Lolland or Laaland, Falster, Möen, &c.; and second, the Fünen group, comprising, besides the large island of that name, the neighbouring islands west of the Great Belt, including Langeland, Aeröe, Fanöe, Taasinge, &c. Besides these, there are the outlying islands of Lessöe and Anholt, in the Kattegat, and Bornholm in the Baltic.

Besides these territories, Denmark possesses the Färöe Islands and Iceland, in the North Atlantic Ocean; Greenland, in the Arctic regions; the islands of Santa Cruz or St. Croix, St. Thomas, and St. John, in the West Indies. She also formerly had some establishments on the coasts of Guinea, in Africa, and of Coromandel, in India; but these have been sold to Great Britain.

For administrative purposes Denmark is divided into bailiwicks.

The following tables give the main divisions of the country, with their area and population, as well as the total area and population of the whole monarchy, according to the census of 1870:—

	Area, Eng. sq. miles.	Population.
Seeland, Möen, and Samsöe	2,793	637,711
Bornholm	221	31,894
Fünen, Langeland, and Aeröe	1,302	236,311
Lolland and Falster	640	90,706
Jutland	9,597	788,119
	14,553	1,784,741

Total Monarchy, including Colonies.

	Area, Eng. sq. miles.	Population.
Denmark	14,553	1,784,741
Färöe Islands	495	9,992
Iceland	30,000	69,763
Greenland (territory free of ice)	25,000	9,825
W. India Islands—Santa Cruz, St. Thomas, St. John	140	37,821
Total of Monarchy	70,188	1,912,142

Previous to 1864 the duchies of Schleswig, Holstein, and Lauenburg belonged to Denmark, which increased the area of the kingdom by about 7363 square miles, and the population by more than a million.

Geology and General Aspect.—Denmark is a very low-lying country, there being no elevation of any consequence throughout the whole kingdom. The greatest height is attained on the eastern side of the peninsula, though even there it never exceeds 550 feet. In respect of geological structure, all the rocks belong to the upper series of the secondary, and to the tertiary formation, and have been deposited from water in regular strata. The rock most fully developed is the chalk, of which several distinct species have been recognized. Above the chalk is an extensive boulder formation, which stretches over a considerable part of the country, and contains some seams of lignite. Immediately above it, and sometimes intermixed with it, are thick beds of clay and marl. Where it prevails, as in Seeland and the east of Jutland, the soil is generally fertile; but in the other parts of the country, and especially in the north and along the west coast of Jutland, where it is supplanted or overlain by deep beds of sand, the country has an extremely desolate aspect, presenting little else than alternations of sand and heath, while its whole west coast is rendered almost uninhabitable by the drift-sand, which has formed an almost uninterrupted line of sterile downs, called *Klitten*, extending from Cape Skaggen to Blaavands Hook, a distance of nearly 200 miles. Along parts of the coast of Jutland are extensive flats or plains, which have been wrested from the sea, and which are protected from its encroachments by huge dykes, as in Holland.

Woods of considerable extent yet exist on the east side of Jutland, which was at one time covered with forests of oak and birch. The coasts are deeply indented with bays and inlets, and in some places are steep and bold, though generally flat and sandy. The larger islands, Seeland, Lolland, and Fünen are fertile and well cultivated, their soils consisting chiefly of clay, mixed with sand and lime. Woods of beech and oak occur in these islands, with partial tracts of moor and heath.

Rivers, Lakes, Sea-arms, Ports, &c.—Denmark has no large rivers; the principal is the Guden, which flows in a north-east direction through the bailiwicks of Skanderborg, Viborg, and Randers, and after receiving several small streams falls into the Kattegat a short distance south of the Mariager Fiord. It is navigable for part of its course. Less important streams are the Holm, the Lonborg, and the Stor Aa. All the others are insignificant streams. There are no rivers in any of the islands, but brooks and streamlets abound. There are a number of lakes, particularly in Jutland, and several in the larger islands; but they are all small, none of them exceeding 5½ miles in length by about 1½ mile broad, and few of them being of more than half that extent. The most remarkable of the physical features of Denmark are its lagoons or fiords, winding inlets of the sea, that penetrate far into the land. The largest of these is the Lymfiord, or Liim Fiord, in Jutland, which, entering the land in the Kattegat, near lat. 57° N., winds its way nearly through the peninsula, and is separated from the North Sea merely by a narrow strip of land, which storms have ruptured in one or two places. It expands here and there in its course into large bays, studded with islands, and throws off branches in all directions—the whole forming a series of the most fantastic ramifications. Most of the streams, lakes, and coasts of the kingdom are well stocked with fish. Besides these inland seas, the Great Belt separates the large islands of Seeland and Fünen, and the Little Belt flows between the latter and the coast of Jutland and Schleswig. Intercourse between the various islands and parts of the kingdom separated from each other by water is necessarily kept up by means of water communication, regular ferries being established at numerous points. Denmark is well supplied with excellent seaports, the most important being Copenhagen, Aalborg, Aarhuus, and Randers.

Climate.—The prevailing characteristic of the climate of Denmark is humidity; it is also remarkably temperate for so northerly a region; both the result of the lowness of the land and of its proximity to the sea on all sides. The winters are seldom severe, though instances of extreme rigour have occurred, as in 1659, when the Swedes marched an army on the ice across the Sound; but the cold is not generally very intense, except in the north of Jutland, where it is greatest. On the other hand the heats of summer are great, sometimes excessive. The mean temperature of the year is 47°; the mean from November to March ranges from 25° to 7°, and the extreme cold in January and February reaches 22° below zero. The mean temperature of June to the middle of August ranges from 59° to 73°, and the extreme heat reaches 89°. The shortest day is about 6½ hours, the longest 17½. Thunder-storms are rare and of short duration. They occur generally in June and August. Violent winds are frequent, and rains and fogs prevalent; but the climate is on the whole favourable to vegetation. A failure of the crops from want of moisture seldom occurs, the loamy soils enduring its absence for a long while without injury, while those of a sandy nature rarely want it for any length of time.

Animal and Vegetable Products.—Horses and cattle are reared in great numbers, and both are excellent. Large flocks of sheep are kept; but rather for the flesh than the wool, which is coarse and short. Swine are also reared to a great extent. Deer, stags, roes, hares, and a variety of other game are met with in the royal and other forests, but do not abound anywhere else. Wild fowl—including the eider-duck, so famous for its down—are numerous. Poultry of all kinds are raised, particularly geese. Potatoes, barley, oats, rye, beans, pease, tares, flax, hemp, madder, and tobacco are raised; wheat in Lolland, &c., and buckwheat in Fünen. Among the garden fruits are apples, plums, cherries, pears, and nuts. Few of the great forests with which the country was once covered now remain, having disappeared from want of care, and from wasteful consumption. Denmark is, in consequence, dependent for her supplies of timber on Norway, Prussia, Russia, and other countries. Government, however, has of late years paid some attention to this source of national wealth, and has taken measures for the protection and better management of the forests. The larger forests are now confined to the east side of Jutland and to Seeland. The principal tree is the beech-tree, constituting, perhaps, about four-fifths of all the growing timber. Oak, though once the most abundant kind of tree, now forms but a small portion of the forests of Denmark; and woods entirely of oak are rarely met with. Birch occurs, in single trees only, in the north-east parts of Seeland, and in Jutland. The elm, ash, willow, and aspen are met with only in small numbers or singly. Pine forests have been planted in the north of Seeland, and in some parts of Jutland.

Agriculture, Cattle Breeding, &c.—Although not particularly favoured by nature, Denmark is yet pre-eminently an agricultural country. The land is greatly subdivided, as the law interdicts the union of small farms into larger, and encourages the division of landed property. The kinds of grain most largely cultivated are barley, rye, wheat, and oats. Barley, the oldest cereal of the north, is grown chiefly in Seeland and in some parts of Jutland, and on the islands of Samsöe and Bornholm. It is largely used in brewing beer, the common beverage of the country, and is manufactured into flour and groats. Rye, the principal product of the soil, is grown throughout the whole peninsula, and in the islands of Fünen and Seeland, and some of the islands on the west coast. From this grain the greater part of the bread used in Denmark is made. Wheat is grown chiefly on the islands of Lolland and Langeland, and on large estates in other quarters of the kingdom. Oats are raised in almost every part of the country; but the best are produced in Jutland. Large quantities of all these grains are exported annually. In a report by Mr. Strachey, British *chargé d'affaires* at Copenhagen, published in 1872, the yearly yield of the cereal crop is estimated at 9,800,000 qrs., and is said to be the largest amount raised by any corresponding European population except that of Mecklenburg. Buckwheat is cultivated in Jutland, in the central part of the duchies, and in the island of Fünen. The cultivation of rape-seed, which has been found to be a profitable crop, has been greatly improved and extended of late years. Potatoes, which were introduced into Denmark early in the present century, are now very generally cultivated. Red and white turnips are also grown, and various kinds of vegetables in considerable quantity. Herbage plants and grass are now carefully cultivated. Beans, pease, and tares are also extensively cultivated throughout the whole country, and form an important article of food. Flax, hemp, hops, tobacco, madder, lavender, and mustard-seed are grown, but not in sufficient quantities to supply the home demand; the deficiency

being imported from other countries. The part of the kingdom best adapted for the production of fruit is the island of Fünen. But cattle-breeding, grazing, and the dairy engage the greatest share of the farmer's attention in Denmark; large numbers of cattle, besides immense quantities of pork and smoked or hung beef, being annually exported from the country. A great increase has of late years taken place also in dairy produce, particularly butter, of which about 26,900,000 lbs. was exported in the year 1870–71. Considerable quantities of cheese are also exported. The rearing of horses is extensively carried on. The Danish horses have long been famous for their strength, symmetry, docility, and bottom; and are especially adapted for cavalry. The old Danish breed is found chiefly in Jutland. Those from the islands are said to be of Tartar descent, and are small, but strong and active. Sheep-rearing is on the decline in Denmark, although considerable improvement has of late taken place in this branch of husbandry, particularly as regards the quality of the wool. The export of wool in the year 1870–71 amounted to 3,469,562 lbs. The rearing of hogs is much attended to; the greatest number are reared in the vicinity of the woods in East Jutland. The rearing of bees occupies a large share of attention, particularly in the duchies and in the island of Fünen, and the production of honey and wax is rapidly increasing; of the latter large quantities are now exported annually, while formerly both honey and wax were imported into the country.

Fisheries.—The fisheries were formerly a more important branch of national industry than now. Two causes have contributed to this result—the extension of agricultural pursuits and the decay of the herring fishing, which has fallen off greatly within the last forty years. The quantity now taken does not suffice for the consumption of the country. Next to the herring the turbot, torsk, and salmon are the most abundant sorts of fish. Oyster banks occur on the east coast of Jutland, near its northern extremity, and near the island of Lessöe. Fish ponds were at one time very general over the country, and were profitable. The seal fisheries of Denmark are considerable, the principal station being the island of Anholt.

Manufactures.—These are comparatively insignificant, and do not comprise any peculiar or national manufacture. There are, however, one or two articles which have attained a considerable reputation; these are the woollens and earthenwares of Jutland, the former a domestic manufacture; the wooden clocks of Bornholm, and a superior kind of stove made in Copenhagen. The manufacture of paper is pretty extensive, and has of late years been greatly improved and extended. There are also iron-foundries, sugar-refineries, some extensive tanneries, and many distilleries. Randers in Jutland, and Odensee in the island of Fünen, were formerly celebrated for the manufacture of gloves; but the peculiar kind of leather from which they were made, and in which their excellence consisted, is now prepared in other countries. The domestic manufactures of Denmark include yarns, knitted and woven woollen goods, linen fabrics, earthenwares, wooden shoes, &c. Almost all other kinds of manufactures are confined to the towns. The people of Denmark bake their own bread, brew their own beer, and spin the greatest portion of the woollen yarn afterwards knitted into stockings or woven into cloth by the village weaver. The women make up their own dresses, and frequently those of their husbands; the latter make the wooden shoes and slippers, and manufacture the greater part of the house furniture and farming utensils. Several of the manufacturing establishments of Denmark belong to the government, and are carried on on its account. Amongst these establishments are a royal porcelain manufactory in Copenhagen, and a royal cloth manufactory in Irsseröd, which supplies cloth for the army.

Commerce, Canals and Railways.—The commerce of Denmark is carried on chiefly with Great Britain, Germany (especially Schleswig-Holstein), Norway, Sweden, and Russia, Germany possessing the largest share. In 1871 the exports to Britain amounted to £2,553,502, and the imports of articles of British home produce to £1,748,933. The chief imports are coffee, tea, sugar, rice, woollens, silks, cottons, earthenware, glass, timber, and metals. The amount of coffee imported in 1870–71 was 13,425,883 lbs.; of tea, 598,294 lbs.; of sugar, 44,926,754 lbs. Among the other imports are tobacco, rice, beer, coal, wood; cotton, flax, and hemp goods, iron, and various manufactured articles. The cottons imported into Denmark are chiefly from England and Germany. The manufactures of Denmark being, as already mentioned, insignificant, the articles exported consist chiefly of agricultural products. The value of the total exports in 1870–71 is estimated at £4,600,000, against £3,700,000 in 1869–70, and £3,200,000 in 1868–69. More than half the whole value exported was in cereals. The commercial marine of Denmark consists of about 2700 vessels, with a total burden of about 182,000 tons. The coasting trade is extensive, and is largely shared in by foreigners. There are two canals in Denmark, one in each of the islands of Seeland and Fünen. There are several railroads. Two are in the island of Seeland, one running from Copenhagen to Helsingör, another from Copenhagen across the island to Korsör. A steam-ferry connects Korsör with Nyborg in Fünen, whence a railway crosses the island, and by means of another ferry communicates with Fredericia. From the latter town a railway runs southward and enters Schleswig. There is also a line running from Aarhuus on the east coast across Jutland to Holstebro. Other lines are in construction or projected.

Moneys, Weights, &c.—The unit of the Danish monetary system is the rigsdaler or daler (dollar) = 2*s.* $2\frac{1}{20}$*d.* The rigsdaler contains 6 marks, and each mark sixteen skillings, consequently the mark = $4\frac{1}{2}$*d.*; the skilling = about $\frac{1}{4}$*d.* Accounts are kept in the last three. Paper dollars are in extensive use. The commercial pound weight is heavier than the English weight of that denomination, 100 lbs. Danish being equal to $110\frac{1}{4}$ lbs. avoirdupois. The principal measure used throughout Denmark for corn is the barrel or toende, which contains 7776 Danish cubic inches or 8488 English cubic inches, and consequently is equal to nearly 4 bushels. The viertel, used for wine and liquor, is equal to 1·7 English gallon. The long measure is the Rhineland foot, which equals 12·356 English inches. The Danish mile is 4·684 English miles. 16 Danish square feet are nearly equal to 17 English square feet. A tonne or toende of hard corn is as much land as can be sown with one toende of rye, one of barley, or two of oats.

People, Education, &c.—The population of Denmark is composed almost exclusively of Danes, with a few thousand Jews and others. The Danes have regular and well-formed features, fair or brownish hair, and blue eyes, with muscular frames; they are kind-hearted, honest, and simple-minded, and continue to maintain their ancient reputation of being bold and hardy seamen. The vast number of islands of which the kingdom consists, and the numerous sea-arms intersecting its continental portion, necessitating a certain amount of acquaintance with seafaring in a large proportion of the agriculturists, tends materially to keep up the maritime spirit. The Jews,

who are of German descent, are confined to Copenhagen and a few other towns. The food of the lower classes consists chiefly of oat-cakes, rye-bread, fish, and cheese. All classes are noted for their hospitality, which is indeed a characteristic of the nation. At the head of the educational institutions stand the University of Copenhagen, and the Holberg Academy at Soröe. In the provincial towns are gymnasia or colleges, in which the learned languages are taught, and a large number of middle schools, for the children of the trading and higher working classes. Primary instruction is given at the public expense in the parochial schools which are spread over the kingdom. Education is very generally diffused, and the fondness for reading which prevails is attested not only by the great number of parochial and other associations for the purpose of procuring works in the various branches of literature, and lending them out among the members, but also by the number of books which individuals in the humblest walks of life, both in town and country, manage to collect for their own private use. The Danish is a Teutonic or Germanic language, and as such is related to the Swedish, Norwegian, German, Dutch, and English. (See below, Danish Language and Literature.)

Government, Laws, Religion, &c.—The government of Denmark was originally an elective monarchy, the right of election being vested in the three estates, the nobles, the clergy, and the commons. But in this arrangement the nobles retained and exercised a power prejudicial to the interests of the state, and offensive to the people. Taking advantage of the popular discontent thus occasioned, the partisans of the crown succeeded in 1660 in prevailing on the deputies of the clergy and commons to make the crown hereditary, and thus circumscribe the influence of the nobles. This proceeding was followed in 1661 by the Act of Sovereignty, which conferred absolute power on the monarch. The power thus conferred had long been used with singular moderation; but in 1848, when, consequent on the sudden changes in France, almost the whole continent of Europe was convulsed, the Danish constitution was greatly modified, and now belongs to the class of hereditary constitutional monarchies. By a charter finally adopted by the king and diet, June 5, 1849, it is declared that the executive power is in the king alone; the legislative, in the king and diet jointly. The person of the king is inviolable, but he rules by a responsible ministry. He must be a member of the evangelical Lutheran Church, which is declared to be the religion of the state. The diet consists of the Landesthing and the Volksthing—the former a kind of senate or upper house, and the latter a house of commons. The Landesthing consists of sixty-six members, of whom twelve are nominated for life by the crown, and the rest elected indirectly by the people for the period of eight years. The fifty-four members of the latter class are chosen by bodies composed partly of the largest tax-payers in the country districts, partly of deputies of the largest tax-payers in the cities, and partly of deputies from all the citizens possessing the franchise. Any person is eligible who has passed his thirtieth year, is of good repute, and does not labour under any mental incapacity. To the Volksthing any male householder, of thirty years of age, is eligible, provided he does not labour under any incapacity which would deprive him of the right of voting. This right is the same in regard both to the Landesthing and the Volksthing, and belongs to every householder who has reached his twenty-fifth year, who is not in the actual receipt of public charity, or who, if he has at any former time been in the receipt of it, has repaid the sums so received, and who does not labour under mental incapacity. The members of the Volksthing are 101 in number, and hold their seats for three years. The diets meet annually on the first Monday of October, provided the king does not summon them on an earlier day. The laws of Denmark are equitable, brief, and explicit, and their administration prompt and effective. In 1795 tribunals of conciliation were established, with the view, as the name implies, of reconciling parties by amicable arrangement, without going into court, and in the great majority of cases the mediation is successful.

The Lutheran is the established religion, but unlimited toleration is extended to every sect, including the Jews, who, by a decree of March 29, 1814, were admitted to an equal participation of civil rights, in regard to the exercise of trades, &c., with the other subjects of the state; but, though electors, they cannot themselves be elected as representatives of any class. The bishops are nominated by the crown.

Army and Navy.—The land force of Denmark, in time of peace, consists of 37,850 men, in time of war increased to 49,253, exclusive of the reserve. According to a law passed in 1867 the army consists of all the able-bodied young men of the kingdom who have arrived at the age of twenty-one years. The time of service is eight years in the regular troops, and afterwards eight more in the reserve. Every corps has to drill for thirty to forty-five days every year. The navy, at the beginning of September, 1872, consisted of thirty-one steam vessels, of which twenty were screw steamers. Six of the screw steamers were iron-clads (two of them on the turret principle), the others were without armour. The iron-clads mounted sixty-five guns in all, and in horse-power ranged between 235 and 600. The navy was manned by 901 men, besides 15 commanders, 34 captains, and 67 lieutenants.

Finances.—The revenue of the kingdom amounted, in the year ending March 31, 1871, to £2,602,180, and the expenditure to £2,433,700, leaving a balance in favour of the former of £168,480. The national debt amounted, on 31st March, 1872, to £12,747,589. The principal branches of revenue are the land tax, and the customs and excise. Next to these are the woods and forests, and other crown property, house tax, lotteries, and tax upon rank and salaries, &c. The annual cost of maintaining the army and navy in 1872–73 was £725,400.

History.—The oldest inhabitants of Denmark whom we find mentioned by name were the Cimbri, who dwelt in the peninsula of Jutland, the *Chersonesus Cimbrica* of the Romans. They first struck terror into the Romans by their incursion, with the Teutones, into the rich provinces of Gaul (113–101 B.C.) After this, led by the mysterious Odin, the Goths broke into Scandinavia, and appointed chiefs from their own nation over Denmark, Norway, and Sweden. Skiold is said to have been the first ruler of Denmark. His history, however, and that of his posterity is involved in fable. All we know with certainty is that Denmark was divided for a considerable time into many small states, that the inhabitants at this period gained their subsistence to a large extent by piracy, and spread terror through every sea, and along every coast to which they came by their valour, ferocity, and rapacity. The eastern coasts of England, and the northern of what is now France, were especially exposed to their ravages. The other inhabitants of Scandinavia as well as the Danes took part in similar piratical expeditions, and along with them are frequently mentioned by the early writers as Normans or Northmen. The first ravages of the Danes in England were in 787. In 876–7 they conquered Normandy under Rolf. Gorm the Old first subdued Jutland about 863, and united

all the small Danish states under his sceptre till 920. His grandson Sweyn, a warlike prince, subdued a part of Norway in 1000, and England in 1013. His son Canute in 1014 not only completed the conquest of England, but also subdued a part of Scotland, and in 1030 all Norway. Under him the power of Denmark reached its highest pitch. Political motives led him to embrace the Christian religion and to introduce it into Denmark, upon which a great change took place in the character of the people. Canute died in 1035, and left a powerful kingdom to his successors, who in 1042 lost England, and in 1047 Norway.

The Danish kingdom was after this very much weakened by intestine broils. Sweyn Magnus Estridsen ascended the throne in 1047, and established a new dynasty; but the feudal system introduced by the wars of Sweyn and Canute robbed the kingdom of all its strength under this dynasty, which furnished not a single worthy prince except the great Waldemar, left the princes dependent on the choice of the bishops and nobility, plunged the peasants into bondage, caused the decay of agriculture, and abandoned commerce to the Hanse towns of Germany. With Waldemar III. in 1376 the male line of the family of Estridsen became extinct. His politic daughter Margaret, after the death of her son Olave IV., A.D. 1387, took the helm of the Danish government, ascended the throne of Sweden and Norway, and established the union of Calmar in 1397.

In 1448, on the extinction of the reigning family, the Danes elected Christian I., count of Oldenburg, to the throne of Denmark. This Christian was the founder of the royal family of Oldenburg, which kept possession of the throne down to 1863, and from which in modern times Russia, Sweden, and Oldenburg have received their rulers. He connected Norway, Schleswig, and Holstein with the crown of Denmark, but was so fettered by his capitulations that he seemed to be rather the head of the royal council than a sovereign king. His son, King John, was bound by a still more strict capitulation in Denmark 1481. In Norway, too, his power was more circumscribed. Holstein and Schleswig he shared with Frederick his brother. King Christian II., son of John, a wicked and cruel, but by no means weak, prince, attempted to throw off his dependence on the states; but in doing it he lost Sweden, which broke the union of Calmar in 1523; and soon after he was deprived of both his other crowns. Denmark and Norway elevated his father's brother, Frederick I., to the throne. Under this prince the aristocracy gained the entire superiority; bondage was established by law; and the Reformation was introduced. Christian III., his eldest son, divided Schleswig and Holstein with his brothers, John and Adolphus, the latter of whom founded the house of Holstein-Gottorp; but this division was the ground of long and bitter disputes. He was succeeded in 1559 by King Frederick II., who conquered the Ditmars, and became involved in a war with Sweden respecting the possession of Livonia. This war was concluded by the Peace of Stettin, 1570. Christian IV., who succeeded in 1588, took part in the Thirty Years' war, and twice engaged in a war with Sweden, the last time with such unhappy consequences that by the Peace of the Broemsebro in 1645 Denmark had to cede to Sweden Jaemptland, Herjedalen beyond the mountains, Gothland, and Oesel, provinces which it had retained ever since the union, besides putting Halland in her hands for thirty years. The faults of the Danish form of government, and the restraints on the crown, had principally contributed to make the Danish arms unsuccessful. The same misfortune attended them also in the new war begun with Sweden by King Frederick III. in 1657. In the Peace of Roeschild in 1658 and that of Copenhagen in 1660 he lost Schonen, Bleckingen, Bohus, and Halland. This caused the abolition in 1660 of the constitution of the states: the nation itself granted the king absolute power, and rendered the crown hereditary. Norway did the same in 1661. The Danish nobility, however, retained the most important offices of state, and the result did not answer the expectations which had been entertained of the new arrangement. Christian V. and Frederick IV. were conquered in the war with Charles XII. Denmark, however, after the fall of Charles XII., gained by the peace of 1720 the toll on the Sound, and maintained possession of Schleswig.

After this the state enjoyed a long repose; but the wounds inflicted by its ill success and its defective form of government could not be healed by the peaceful system now adopted. Denmark having but few resources can prosper only by wise moderation and careful management. The political machine once disordered requires a long time for restoration. In 1726 Denmark united with the crown the county of Ranzau; in 1761 Holstein-Ploen; and in 1773 Holstein-Gottorp. In return for the latter, by a treaty with Russia, it ceded the counties of Oldenburg and Delmenhorst, which were acquired in 1667. In 1730 Christian VI. succeeded Frederick IV., and left his crown in 1746 to his son Frederick V. Christian VII. received the sceptre in 1766. He governed entirely by his ministers. (See the article STRUENSEE.) In consequence of his mental imbecility the reins of government were committed to his son, who ruled first in the character of regent, and afterwards, on his father's death in 1808, assumed the title of Frederick VI.

In consequence of the defensive alliance with Russia in 1788, a Danish auxiliary corps marched into Sweden without opposition; but, on the representations of England and Prussia, an armistice was concluded a fortnight after the commencement of hostilities. Thus ended this fruitless campaign, which imposed on the impoverished finances a burden of 7,000,000 rix dollars. Denmark maintained her neutrality with more success in 1792, when the allied powers wished her to take part in the war against France. But by her accession to the northern confederacy in 1800, she was involved in a war with Great Britain, in which the Danish fleet was defeated at Copenhagen, April 2, 1801. The courage of the Danes, however, obtained for them a truce, upon which Denmark acceded to the treaty of Russia with England, completed July 20, evacuated Hamburg and Lübeck, of which she had possession, and received back her own colonies.

At length, in 1807, this state was included in Napoleon's continental policy. A French army stood on the borders of Denmark, Russia had adopted the continental system at the peace of Tilsit, and England thought it her duty to prevent the accession of Denmark to this alliance. A fleet of twenty-three ships of the line was sent up the Sound, August 3, which demanded of Denmark a defensive alliance, or the surrender of her fleet as a pledge of her neutrality. Both were denied. Upon this a British army landed, consisting of 25,000 men, under Lord Cathcart; and, after an unsuccessful resistance on the part of the Danes, Copenhagen was surrounded, August 17. As the government repeatedly refused to yield to the British demands, the capital was bombarded for three days, and 400 houses laid in ashes, in the ruins of which 1300 of the inhabitants perished. September 7, Copenhagen capitulated, and the whole fleet was delivered up to the British. The crews were made prisoners of war.

Great Britain now offered the crown-prince neutrality or an alliance. The crown-prince, however, rejected all proposals, declared war against Great Britain in October, 1807, and entered into a treaty with Napoleon at Fontainebleau, October 31. Upon this Bernadotte occupied the Danish islands with 30,000 men, in order to land in Sweden, against which Denmark had declared war in April, 1808. This plan was defeated by the war with Austria in 1809, and the hostilities against Sweden in Norway ceased the same year. The demand made by the court of Stockholm, in 1813, of a transfer of Norway to Sweden, was followed by a new war with this crown, and a new alliance with Napoleon, July 10, 1813. On this account, after the battle of Leipzig, the northern powers, who were united against France, occupied Holstein and Schleswig, Glückstadt and other fortifications were captured, and the Danish troops driven beyond Flensburg. Denmark now concluded a peace with England and Sweden, January 14, 1814, at Kiel. She also entered into an alliance against France, and contributed a body of troops to the allied forces. She was obliged to cede Heligoland to Great Britain (receiving in exchange the West India Islands), and Norway to Sweden (for which she was compensated by Swedish Pomerania and Rügen). A peace was concluded with Russia in February, 1814. January 14, 1815, Denmark ceded Swedish Pomerania and Rügen to Prussia, and received for them Lauenburg and a pecuniary compensation. June 8, 1815, the king entered into the German confederacy with Holstein and Lauenburg, and received in it the tenth place, and three votes in the general assembly (the *plenum*); after which, by the appointment of a decemviral commission, preliminary measures were taken to introduce a representative government into Holstein. Frederick VI. was succeeded in 1839 by Christian VIII., during whose reign (in 1846) Schleswig was, by letters patent, declared inseparable from the crown of Denmark. His son Frederick VII. succeeded in 1848. In the spring of the following year Schleswig and Holstein revolted, and were not brought finally back to Denmark till 1852. In 1857 the Sound dues were abolished. Frederick VII. died in 1863, and with him the Oldenburg line became extinct. He was succeeded by Christian IX. (Prince of Sonderburg-Glücksburg).

At the commencement of 1864 the Danish territory was politically distributed into four parts, viz. Denmark Proper (consisting of the Danish islands and North Jutland), the duchy of Schleswig or South Jutland, with a population more than one-half Danish, the remainder Frisian and German; the duchy of Holstein, purely German; the duchy of Lauenburg, also German. The policy of the Danish government in respect to the German part of the inhabitants of the duchies, chiefly in the alleged coercing them into a forced assimilation to the Danes, and especially in compelling the use of the Danish language in the state schools, had long given umbrage to the German powers. Certain measures of the Danish government, and the strong remonstrances offered to them by the German Confederation—even menacing the validity of the Treaty of London of 1852, by which the principal European powers recognized the sovereignty of the King of Denmark over the duchies—brought matters to a crisis in 1863. On the last day of that year, in consequence of the confederation resolving on federal interference in the duchies, the Danish troops evacuated Rendsburg on the Eider, which separates Holstein from Schleswig, and 5000 Saxon troops immediately entered the town, and were enthusiastically welcomed by the inhabitants. In January, 1864, a misunderstanding arose between the federal diet and Austria and Prussia, whereupon the two latter powers determined upon independent action, and Holstein was occupied by them with detachments of troops. The popular feeling in the duchy was almost unanimously in favour of Germany, and an address was presented to the federal diet by a deputation from it, offering homage to the Duke of Augustenburg, the heir of the Schleswig-Holstein crown, as their lawful sovereign. On Feb. 1 the Prussian forces marched from Kiel under Marshal Wrangel across the Schleswig frontier, and occupied Gottorp, the Danes retiring at their approach. The first conflict occurred near Missunde on the Schlei; after which the Prussian troops crossed the Schlei by night in boats, to turn the left flank of the Danish army, and another body crossed by a pontoon-bridge in order to unite with the former, and take the Dannewerk in the rear, while the Austrians pressed it in front; but during the night the Danes evacuated their position, abandoned all their artillery in the forts, and retired northwards, concentrating their forces about Fredericia, Düppel, and on the island of Alsen. The Prussians addressed themselves to the siege of Düppel, the *tête-du-pont* of the island of Alsen, till the 18th of April, when they became finally masters of the place; and then they entered Jutland, where their conduct became very arbitrary and oppressive. The British government endeavoured to put a stop to the further progress of the war by proposing a conference of the great powers upon the basis of maintaining the integrity of the Danish monarchy, under the provisions of the treaty of 1852, but Prussia, for her part, now declined to be longer bound by that treaty. The conference, however, assembled at London on April 25, and an armistice was agreed upon till June 12, and afterwards prolonged to June 26. On June 22 the labours of the conference, directed to the arrangement of some compromise which should secure proper consideration for Denmark, came to an abortive result, and at the end of the month active hostilities were resumed. Alsen, which had remained in the occupation of the Danes, was captured by the Prussians, who crossed in considerable force at midnight of the 29th. The loss of Alsen, and necessary abandonment of Fredericia, decided the struggle, and Denmark was compelled to yield and accept terms of peace. Negotiations took place at Vienna, and on Aug. 1 preliminaries were signed by the respective powers, to the effect that 'the King of Denmark renounced his rights to the duchies of Schleswig, Holstein, and Lauenburg; and moreover ceded those parts of Jutland situated to the south of the district of Ribe laid down upon the maps, and sundry small islands adjacent, an equivalent portion of Schleswig, comprising, exclusive of the island of Aeröe, the territories connecting the district of Ribe with the rest of Jutland, being transferred to Denmark for the purpose of rectifying the frontier line; the debts of the Kingdom of Denmark to be apportioned between the duchies and the kingdom proper.' A treaty of peace, in accordance with these preliminary terms, was subsequently signed at Vienna, on Oct. 1, 1864. The Austrian troops occupied Holstein, and the Prussians Schleswig. It was not long, however, until a difference of policy began to show itself between these two powers: Prussia was believed to have the intention of annexing the duchies, while Austria favoured the claims of Prince Frederick of Augustenburg to the dukedom, and wished to refer the matter to the German Bund. On June 1, 1866, in the sitting of the German diet, Austria, disregarding the October treaty, placed the matter in the hands of the Bund, and convoked the states of Holstein 'to assist in the settlement of the future destination of the duchy.' This proceeding

Prussia treated as an insult, and demanded the re-establishment of a joint occupation; and, while inviting Austria to send troops into Schleswig, marched troops of her own into Holstein. The Austrians, however, withdrew from the duchies altogether, and war was declared. By the treaty which followed the decisive battle of Königgrätz (3d July, 1866), the duchies were incorporated with Prussia.

Danish Language and Literature.—The Danish language belongs to the Scandinavian branch of the Teutonic family of languages, and is a sister of the Swedish and Norwegian. It is not descended from the so-called Old Norse (ancient Norwegian and Icelandic), as has been commonly believed, but stands to it rather in the relation of a younger sister. It had no doubt a dialectic existence of its own in early times, though it was influenced and modified by the ancient Norwegian and Swedish. Doubtless the close connection between the Danes and Anglo-Saxons had some effect in modifying the Scandinavian forms, and in determining the sharper dialectic separation of the Danish from the other dialects of Scandinavia. Of much more importance, however, for the independent development of the language was the intercourse by trade and otherwise between Denmark and Germany; but what exercised the greatest influence on the language, and finally determined its independence and nationality, was the Reformation. As was the case with the German, the translation of the Bible into the popular tongue really laid the foundation of Danish as a national literary language. Fresh elements of vitality were introduced in later times by the study of the Old Norse literature, and Danish has firmly established itself among the cultivated languages of modern Europe. Besides being the language of Jutland, the islands, and North Schleswig, Danish is the official language of Iceland, the Färöes, Greenland, and the Danish West Indies. From the union of Norway with Denmark in the end of the fourteenth century, Danish became the written language of the Norwegians, and it still continues to be the language of the towns and educated people, though the efforts of a party in Norway to cultivate the Norwegian as a literary language have not been without some success.

Danish is one of the softest and richest languages of Europe. The alphabet, according to Rask and others, numbers twenty-seven letters, namely, *a*, *i*, *o*, *u* (pronounced as in German and Italian), *e* (*é* and *è*, French), *y* (*u* in French, and *ü* in German); *b*, *c*, *f*, *k*, *l*, *m*, *n*, *p*, *t*, *v* (all as in English); *d* (four sounds, final after a vowel like *th* in 'birth,' final after a consonant as in English, very soft between vowels, nearly silent after *l*, *n*, *r*, and having the effect of almost doubling these letters), *g* (hard, as in 'go'), *h* (always aspirated), *j* (like *y* in 'yes'), *r* (rough), *s* (like *s* in 'son'), *x* (=ks); *å* or *aa* (like *oa* in 'broad'), *æ* (like *ai* in 'sail'), *ø* (like *eu* in French, *peu*), *ö* (like *eu* in French *veuve*, or *œu* in *cœur*).

The oldest literary monuments of the Danish language do not go farther back than the twelfth century, and consist of the laws of the early kings. Next to these come the historical works of Saxo-Grammaticus and the Jutish knight Swend Aagesen, which are indeed written in the Latin language, but quite in the Norse spirit. Some of the Danish heroic ballads (Kjämpeviser) are as old as the thirteenth century, but the majority of them belong to the fourteenth, and such of them as are really historical to the fifteenth and sixteenth centuries. These poems, the roots of which stretch backwards to the Sagas of the ancient north, and which combine the romantic tendency of the later middle ages with elements derived from the northern mythology, were collected before they had vanished from the mouths of the people by A. S. Vedel (Et Hundret udvalgte danske Viser; Ribe, 1591, often reprinted). Enlarged collections, some of them with critical and historical annotations, have since been published. Other ancient literary monuments, in addition to a work on medicine, by Henrik Harpestreng, belonging probably to the thirteenth century, are the Danish Rhyming Chronicle, by Brother Njel of Soröe, probably completed about 1478, and a Danish translation of the Old Testament, belonging to the same period. In the end of the fifteenth century, Mikkel, a clergyman of Odensee, wrote religious poems, which, although they contain much insipidity, yet display a poetic genius of considerable power. The collection of proverbs and sententious sayings, compiled about the beginning of the fifteenth century, by Petrus Legista, continued a favourite school-book down into the Reformation period.

Although the Latin language, the study of which was brought into still greater favour by the Reformation, left the popular language but little room till some time into the seventeenth century, yet the Reformation, the representatives of which had necessarily to address the people in the popular tongue, was the cause of the development of a literary language in Denmark. Christiern Pedersen (1480–1554) was the greatest writer of Denmark in the Reformation period, standing in the same relation to the Danish language as Luther did to the German. Besides producing the people's books, Keiser Karl's Krönike (Copenhagen, 1501), and Olger Danske's Krönike (Paris, 1514), he sought also to supply the spiritual wants of the people by such works as the book of prayers, Vor Frue Tider, and Jertegns Postille. He also made a new translation of the New Testament and the Psalter. Next to Pedersen, important services were rendered by Paul Eliä, Peter Lille, of Roeskilde, Hans Tausen, and Petrus Palladius. Many appeared also as song-writers. At the head of all works belonging to this period, however, must be placed the translation of the Bible (1550) which Christian III. caused to be executed—a national work, and as regards the language, a masterpiece. The Reformation also gave a considerable impulse to scientific investigation, and in particular to the study of history. In the sixteenth and seventeenth centuries a great number of works in the national history were written, among the writers of which we may mention Hans Svaning the elder, the excellent writer Anders Sörensen Vedel (born 1482; died 1516), Arild Hirtfeld (Danmarks Riges Krönike, ten vols. 1595–1604), Niels Krag, Claus Christopher Lyschander (Danske Kongers Slägtebog, Copenh. 1622), John Isaac Pontanus, Vitus Bering, Hans Svaning, the younger, Jonas Ramus, &c. The study of philology and antiquities in general now began to be cultivated, and especially the antiquities of the North. In this department the names of Gudmund Andreä, Runolf Johnson, Arngrim Johnson, Ol. Worm, Thom. Bertolin the younger, Peder Rosen, Otto Sperling, and especially Peder Syv, may be mentioned.

The first beginnings of modern Danish poetry make their appearance in the period succeeding the Reformation. Hymns, edifying narratives, and dramatic pieces were composed, the material of which was mostly furnished by the Bible. Biblical history was treated dramatically by not a few writers in the seventeenth century, following the example of Hieron. Justesen Raach (died in 1609) in his often-reprinted dramas, Kong Salomon's Hylding (1585), Samson's Fängsel (1633), and Karrig Nidding (1633), and of Peder Hegelund (died 1614), in his Susanna (1578). This series of writers was closed by Erik

Pontoppidan the elder (died in 1678), with the Comödie om Tobia Giftermaal. Anders Arrebo (died 1637) first attempted in his Hexameron to strike the lofty epic strain; and Anders Bording (died 1677) was successful as a writer of lyrics. Danish poetry first attained a more elevated stage in the lyric poet Thomas Kingo (1634–1723), who, in his Aandelige Sjungechor and his Kirke-Psalmebog, presented his countrymen with a rich store of noble sacred poetry; and in his contemporary Jörgen Sorterup (died 1722), who revived the old heroic poem with the genuine Norse spirit. To this period belong also the Norwegian Peder Dass (died 1708), who wrote biblical and popular pieces, Jens Sten Sehested (died 1695), and Povel Juul (died 1723), who devoted themselves to didactic and descriptive poetry.

A new epoch in the national literature of Denmark began with Louis Holberg (1684–1754; see HOLBERG). He was the founder of the Danish stage, and through his poetical and prose writings gave an abiding influence to the national character, though he founded no distinct poetic school. Holberg, and in the second half of the century Ewald, equally distinguished as a lyric and as a dramatic poet, are the two names that mark the brightest period of the national literature of Denmark. In this century criticism began to exercise a beneficial influence on the culture of the language, various critical magazines being published and scientific criticism established. Along with Holberg, and to a large extent urged on by his genius, appear the poets Christian Falster (d. 1752), a caustic satirist, and Braumann Tullin (d. 1765), who sought to distinguish himself in lyric and descriptive poetry. In the time of Christian VI. the second important religious poet of Denmark wrote, viz. Hans Adolf Brorson, who left far behind him his contemporary Ambrosius Stub. Other names belonging to the later part of the eighteenth century are those of the comic dramatists Wessel, Wiwet, Tode, Falsen, and Olufsen, but all of these are eclipsed by that of Peder Andreas Heiberg. The first really national tragedy was Ewald's Rolf Krage. The drama was also enriched by Ole Johan Samsöe (d. 1796) and Levin Christian Sander (d. 1819). As lyric poets we may mention the names of the brothers Claus and Peder Harboe Friman, Johan Nordahl Bruun (who wrote patriotic songs), Jens Zetlitz (the author of humorous and lively pieces), and Eduard Storm, who imitated the old heroic poems. The brothers Peder Magnus and Peder Kofod Trojel were satirists of considerable originality and causticity. But in reputation and fertility all these poets stand far behind Jens Baggesen (see BAGGESEN), the favourite songster of the Danish people.

Fresh life was inspired into Danish poetry by Adam Oehlschlager (born in 1779), contemporary with whom was Adolf Wilhelm Schack Staffeldt (1770–1826), a lyric poet of the first rank. In 1811 Bernhard Severin Ingemann made his appearance, first as a lyric poet, but afterwards turned his attention to the drama, and later to the historic romance. Grundtvig should next be mentioned as a writer of religious poetry. Among dramatic writers the names of Johan Ludwig Heiberg, Overskou, Hostrup, Erik Bögh, Chievitz, and Rosenhoff are well known. Tragedies and comedies have been written by Boye, but his poetic reputation rests chiefly on his psalms. Among song-writers we may mention Hertz, Heiberg, Andersen, Blicher, Hölst, and Rosenhoff. The erotic poems of Ch. Winther, and the patriotic songs of P. E. Ploug, have acquired a considerable reputation, as well as the poems of P. Möller. Among those who have displayed a talent for novel-writing are Winther, mentioned above; Sten Stensen Blicher, who describes common life in Jutland with poetic truth; the writer known as Karl Bernhard; and Mrs. Gyllembourg-Ehrensvärd, whose stories have passed through many editions. Among the most distinguished modern writers we must mention Hendrik Hertz, a lyric poet and dramatist; Frederik Paludan-Müller, whose satirical poem, Adam Homo, is regarded as the most important contribution to modern Danish poetry; Ch. Molbech, a lyric poet of talents; Hans Christian Andersen, whose stories are known throughout the whole of Europe; and Waldemar Thisted, a lyrist and novel-writer of considerable note.

In the study of the history and antiquities of the North the Danes have greatly distinguished themselves during the last and present centuries; among the chief of the early names in this department are those of Thormod Torfäus and Arna Magnäus. In the editing and explaining of the ancient northern literature important services were rendered by Halfdan Einersen, Olaf Olavius, Hans Finsen, Finn Johnsen, Björn Haldersen, Stephan Björnsen, John Olavsen, Skule Thorlacius, and Grim Johnsen Thorkelin (died 1829). Erik Pontoppidan (d. 1764), Andreas Hojer, L. Holberg, Ove Högh-Guldberg, Tyge Rothe, Ove Malling, &c., were the most influential historians of the eighteenth century. In the present century Danish literature and literary history have been greatly indebted to such scholars as Finn Magnussen, Rask, P. E. Müller, Rafn, Thomsen, Petersen, Nyerup, and Molbech. Among other historical writers we may mention the names of Grundtvig, Paludan-Müller, Jahn, Hammerich, Baden, Hübertz, Barfod, &c. In the department of classical philology Madvig has gained himself a European reputation as a Latinist, Westergaard and Fausböll have distinguished themselves as Sanskrit scholars, Mehren and Sörensen as Arabic scholars; Rask ranks among the greatest philologists of the century; Sibbern and Nielsen are philosophical writers. In natural science we may mention the well-known names of Oersted, Forchhammer, Steenstrup, Kröyer, Hornemann, and Schouw.

DENNEWITZ, a small Prussian village in the circle of Potsdam, famous for the battle between the French and Prussians, September 6, 1813, the former commanded by Ney (under whom were Oudinot, Bertrand, Reynier, and Arrighi), the latter by Tauentzien and Bülow. 40,000 Prussians maintained their ground for several hours against 80,000 French; and on the arrival of the Russian and Swedish battalions victory declared in favour of the allies, who, after the Russians and Swedes came up, were far superior in numbers. The French were defeated, and fled in disorder, with their auxiliaries, consisting of Bavarians, Wurtembergians, Saxons, and Poles. This battle was a consequence of the battle at Grossbeeren (which see).

DENNIS, JOHN, an English dramatist and critic, born in London in 1657. Having completed his studies at Cambridge he made the tour of France and Italy, and on his return devoted himself to literary occupations, living upon his fortune, which had been left him by an uncle. In 1697 he produced a comedy entitled Plot and No Plot, which was followed by several dramatic pieces and poems of little value. He also became a political writer for the Whig party. The irritability of his disposition, heightened probably by the unprosperous state of his finances, involved him in perpetual broils, and made him a sort of standing jest with the wits of his time. Having written a tragedy entitled Liberty Asserted, which became popular during the war with Louis XIV., in consequence of the abuse of the French with which it abounded, Dennis thought that monarch would never forgive the insult: when, therefore, the Treaty of

Utrecht was about to be concluded, he entreated the Duke of Marlborough to save him from being delivered up to the French government as a state criminal. The duke told him that he thought he might make himself easy; for though he had, he conceived, done as much harm to the French as Mr. Dennis, he had not thought it necessary to seek for personal indemnity. When his Appius and Virginia was performed he introduced a new method of imitating thunder, said to be still used at the theatre. The tragedy was soon set aside; but some time after, Dennis, being present at the representation of Macbeth, perceived that his new invention had been adopted; on which he exclaimed, 'S'death! how these rascals use me; they will not let my play run, yet they steal my thunder.' He wrote some severe strictures on Addison's Cato and Pope's Rape of the Lock. Pope in return gave him a place in the Dunciad, and in conjunction with Swift produced a sarcastic tract entitled A Narrative of the Deplorable Frenzy of Mr. John Dennis. After he had dissipated his fortune the Duke of Marlborough procured him the place of land waiter at the custom-house. This he disposed of, reserving only a temporary annuity; and in his old age his necessities were relieved by a benefit at the Haymarket Theatre, to which his former antagonist, Pope, contributed a prologue. He died soon after, January 6, 1734.

DENNY, the name of a town in Stirlingshire, situated on the south bank of the Carron, about 18 miles from Glasgow. It is a thriving place, from its proximity to several paper-mills, print-fields, and other public works. It also derives considerable trade from its vicinity to the Forth and Clyde Canal, which affords a ready conveyance for the freestone and coal abounding in the neighbourhood. Pop. 3623.

DENON, Dominique Vivant, Baron de, a distinguished French artist, was born Feb. 4, 1747, at Châlons-sur-Saône, of a noble family. He was destined to study law at Paris, where he was favourably received in society; and his talent and inclination led him to devote himself to the arts. His amiable manners made him a favourite of Louis XV., who appointed him *gentilhomme ordinaire* about his person. He was afterwards attached to an embassy at St. Petersburg. Subsequently he was intrusted with a diplomatic mission to Switzerland. On this occasion he drew Voltaire's likeness (engraved by St. Aubin), and the well-known picture Le Déjeûner de Ferney. He then occupied, during seven years, a place in the French embassy at Naples. His residence in the city, and repeated visits to Sicily and Malta, gave him an opportunity of exercising his talent for drawing and engraving. Denon had the principal direction of the artists engaged in preparing the Abbé St. Non's Voyage Pittoresque de Naples et de Sicile, and the text was chiefly taken from his journal. This elegant work appeared at Paris in 1788. The remainder of Denon's journal relating to Sicily and Malta appeared separately in 1788. He resided at Venice during several years, where he shone in the circle of the Countess Albrizzi. The observation and restraint to which the revolution subjected Frenchmen in foreign countries, compelled him to leave Venice. After a short stay in Florence and Switzerland he returned to France, and he became acquainted with Bonaparte. He accompanied the general in his campaigns to Italy and Egypt, and Desaix to Upper Egypt. The work which was the result of this journey (Voyage dans la Basse et la Haute Égypte) was an addition to Denon's fame, particularly the engravings which ornament it (Paris, 1802, two volumes folio, and three volumes 12mo, without engravings). Denon, in this, has shown himself a very able artist. When he returned to Paris with Bonaparte he was appointed inspector-general of the museums and all the works of art executed in honour of the French successes—monuments, coins, the erection of the triumphal pillar in the Place de Vendôme, &c. He accompanied Napoleon in all his campaigns, and employed himself in drawing and in selecting those masterpieces in the conquered countries, which were taken to Paris as trophies. In 1815 he was compelled to witness the restoration of the spoils. After the abdication of the emperor he retained his office, but was deprived of it in 1815, in consequence of having joined Napoleon on his return from Elba. He retained, however, his place in the Institute. From that time he lived retired, and the preparation of engravings and lithographs of his splendid collection of works of art formed the occupation of his last years. He died at Paris in April, 1825. His mind was active to the last. In 1826 appeared at Paris the Description des Objets d'Art Composant le Cabinet de feu M. le Bar. V. Denon, in three volumes (*Monumens antiques, tableaux et estampes*). The cabinet was sold by auction.

DENSITY is a term denoting the quantity of matter per unit of volume of a body. A cubic inch of lead is considered to have a greater quantity of matter than a cubic inch of wood, and lead is thus said to be more dense than wood. Mass, or quantity of matter, is measured by its inertia, according to Newton's celebrated 'laws of motion:' or, since Newton has shown experimentally that gravity and inertia are proportional, the mass of a body is measured by its weight. A comparison of the weights of equal bulks of various bodies affords, therefore, a comparison of their densities. In order to assign the densities of various bodies conveniently, a standard substance is fixed on, and the densities of other substances are stated by comparison with it. For all liquids and solids, water at a fixed temperature is taken as the standard; and for all gases the standard is common air at a fixed temperature and barometric pressure. There is, however, some variation in the temperature fixed on in the first case, and in both the temperature and pressure fixed on in the second. Thus in England the standard temperature for water used to be 60° Fahr. and sometimes 62° Fahr. The latter temperature is mentioned in the legal definition of the imperial gallon. Again, in the case of gases the standard temperature was 60° F. or 62° F., and the standard pressure 30 inches of mercury in the latitude of London. The metric system, on the other hand, makes use of the temperature 4°·1 Centigrade (the temperature of the maximum density of water) as the standard for water, and of the pressure 76 centimetres of mercury in latitude 45° as the standard barometric pressure. For gases the temperature 0° C. (the melting-point of ice) is always employed as the standard. The method of determining the density of solids, fluids, and gases is described under Specific Gravity; and a table of densities or specific gravities of the most important bodies is there given.

Density of the Earth.—The determination of the density of the earth as compared with that of water, or any other known body, is a subject which has excited considerable interest amongst modern mathematicians; and nothing can, at first sight, seem more beyond the reach of human science than the due solution of this problem; yet this has been determined, and on such principles that, if it be not correctly true, it is probably an extremely near approximation. The first idea of determining the density of the earth was suggested by M. Bouguer, in consequence of the attraction of Chimborazo, which affected his plumb-line while engaged with Condamine in measuring a

degree of the meridian, near Quito, in Peru. This led to the experiments on the mountain Schehallien, in Scotland, which were carried on under the direction of Dr. Maskelyne, and afterwards submitted to calculation by Dr. Hutton, who determined the density of the earth to be to that of water as $4\frac{1}{2}$ to 1. But in consequence of the specific gravity of the mountain being assumed rather less than it ought to have been, the above result is less than the true density, as has since been shown by Dr. Hutton and Professor Playfair, the former of whom makes it, in his corrected paper, as 99 to 20, or nearly as 5 to 1. The same problem was attempted on similar principles, but in a totally different manner, by Henry Cavendish, who found the density of the earth to be to that of water as 5·48 to 1. Taking a mean of all these we have the density of the earth to that of water as 5·24 to 1. Another estimate, founded on observations at the bottom of one of the deepest coal-mines in Durham, has been made by Mr. Airy.

DENTATUS, M' CURIUS, said to have been so named from having been born with teeth, was of Sabine descent, and flourished in the first half of the third century B.C. His first office was tribune of the people, in which he distinguished himself by his opposition to Appius Claudius Cæcus, who, in defiance of law, refused to receive any votes for plebeian candidates. In B.C. 290 he was consul along with P. Cornelius Rufinus, and by his decisive victories over the Samnites terminated a war which had lasted for forty-nine years. In B.C. 275 he was again consul, and near Beneventum encountered King Pyrrhus, who was so completely defeated that he was obliged to quit Italy. The triumph which followed was one of the most magnificent which had ever been witnessed, and was remarkable for the presence of four elephants, which were then seen for the first time in the streets of Rome. In B.C. 274 he was a third time consul, and after terminating the war with the Lucanians, Samnites, and Bruttians, retired to his Sabine farm and spent the remainder of his life in cultivating it. Taken all in all he is one of the noblest specimens of the genuine old Roman. He died about B.C. 270.

DENTEX, a genus of fishes placed by Cuvier in the order Acanthopterygii, and the family of the Sparidæ. This genus is characterized by having conical teeth, even on the sides of the jaws, and generally in one range; and those immediately in front are lengthened into large hooks. The *Dentex vulgaris* is well known through the whole length of the Mediterranean, and has occasionally been found on the southern shores of Great Britain. It is distinguished for its large size as compared with others with which it has been usual to associate it, as well as by its rapid growth and eagerness in pursuit of prey. In its general aspect it bears a resemblance to the becker, or common sea-bream, but the proportions are described as rather longer and more solid. The back is also elevated and thinner, and the lower jaw rather longer. The head is flat on the top, and the eyes are high on the cheek. The scales on the body and gill-covers are large. The lateral line passes near the back, and descends towards the tail. The pectoral fin is long and pointed, the tail concave, the dorsal fin a little expanded at its end, and the anal fin rather short. It is esteemed as an article of food in the countries bordering on the Mediterranean, where it is preserved in vinegar and spices.

DENTIFRICE, a preparation for cleaning the teeth, of which there are various kinds; generally, however, they are made of earthy substances mixed with alum. Those formed of acids are very pernicious.

DENTILS, the little cubes resembling teeth, into which the square member in the bed-moulding of an Ionic, Corinthian, or Composite cornice is divided.

DENTINE, another name for the enamel of the teeth. See TEETH.

DENTITION, including both the formation and the cutting of the teeth, is one of the most important organic processes of childhood and adolescence. The pulpy nucleus appears about the third month of pregnancy, and at the end of it the jaws contain the twenty follicles which are to produce the first teeth. Those of the second dentition appear from the fifth to the ninth month of fœtal life, but some it is said do not appear before the end of the second year. The first teeth are usually cut in the six last months of the first year. The middle incisors of the lower jaw show themselves first, then some incisors of the upper jaw; the other teeth follow, proceeding from the centre backwards, except in the case of the canines, which in general make their appearance only before the four last molars. The number of teeth is then twenty. All are temporary, and are to be replaced by those of the second dentition. The first dentition is usually completed during the last months of the second year. In some instances children have been born with teeth, and in many instances the first teeth do not make their appearance till after the tenth or even the twelfth month. At the age of six and a half to seven secondary teeth commence cutting, and a third molar is added to the former two on each side of each jaw. At the same time the roots of the temporary teeth being resorbed the teeth themselves become loose, fall out, and are replaced in the same order as at the original cutting. The renewal of the incisors commences about the seventh and is not completed till the ninth year. Then an interval takes place. Towards the tenth year the first permanent molar or bicuspid appears, next the canine, and then the second bicuspid. The bicuspids are of less size than the molars which they replace, the incisors and canines on the contrary are larger. On the regularity of these proportions depends the greater or less facility in the arrangement of the teeth subsequently cut. From ten and a half to eleven years the second great molars appear, and last of all, usually from eighteen to twenty-five, the teething is completed by the cutting of the last molars or wisdom teeth. Besides the differences already mentioned between the first and second teeth, the incisors of the latter present on their anterior face two salient lines parallel to the axis of the tooth, and the roots of all of them are larger than those of the former. When the dental process is being performed, the bones, which are the site of it, receive a development proportioned to the augmentation of the teeth in number and volume. Thus the temporary incisors, which at two years are in contact, become separated by small intervals, the curvature of the dental arcs also changes, and the alveolar edge of the upper jaw becomes rectilinear, so that if placed on a plain surface it touches it throughout its whole length. The angle formed by the ascending branch of the upper jaw becomes much less obtuse, and the lower part of the face is visibly augmented in size. It is chiefly when the temporary teeth are going to appear that a kind of disturbance of the general functions of the body takes place. Congestion towards the jaws, and consequently towards the head, is the first effect or rather the essential condition of dental evolution, and this phenomenon involves many others, as affections of the brain, imperfect digestion, and loss or diminution of sleep, either by nervous excitement or the pain which the child suffers. In the second dentition the disturbance is more rare and less visible, but is often manifested by earache, headache, swelling of the salivary glands,

&c. Even the cutting of wisdom teeth is sometimes accompanied with general morbid symptoms.

D'ENTRECASTEAUX.—1. A channel formed between the south-east cape of Van Diemen's Land and Bruny Island. It is about 40 miles in length, in a N.E. and N.N.E. direction, having several bays and harbours on the east side, and two on the west, Mussel Bay and Recherche Bay, where ships may be sheltered from nearly all winds. The strait affords anchorage in many places, in from 20 to 8 or 6 fathoms. There are several isles in it, but not many hidden dangers.—2. D'Entrecasteaux Isles, S.S.W. Papua, in about lat. 10° S.; and lon. 150° 30′ E. They are yet but little known.

DENUDATION, in geology, the act of washing away the surface of the earth by water, either in the form of constant currents or of occasional floods. See GEOLOGY.

DENVER, a city in the United States, in the territory of Colorado, of which it is the principal town and emporium, on the right bank of the South Platte River, 15 miles east of the Rocky Mountains. A branch line connects it with the Pacific Railway. The site is pleasant and picturesque, occupying a series of plateaux rising gently from the river. The town is well built and lighted with gas, for which coal exists in the vicinity; and a canal, 20 miles long from the river where it issues from the hills, supplies every part of it with water. All the government and public offices of the territory are established here; and there are a Roman Catholic and other seminaries, several churches, a branch of the United States mint, a bank, a theatre, hotels, flour-mills, breweries, and tanneries. The climate is peculiarly dry and salubrious. The town was founded in 1858; the pop. in 1870 was 4759.

DEODAND (*Deo dandum*), a thing to be given or dedicated to God, an obsolete legal term for anything that had caused a person's death, all such chattels being forfeited by the old rule of the common law of England. It is an ancient doctrine mentioned by Bracton, and its origin was attributed to the notion, that where a man was suddenly cut off in his sins, expiation ought to be made for the benefit of his soul; and, accordingly, the chattel which occasioned his death should be forfeited to the king, to be devoted by him to pious uses. A statute of the time of Edward I. relating to coroners, provided that 'horses, boats, carts, mills, &c., whereby any are slain, that properly are called *deodands*, shall be valued and delivered unto the towns,' which thereupon became answerable to the king for their value; in whose behalf the sheriff might levy the amount upon the inhabitants of the town. Accordingly, in all indictments for homicide, in England, the grand-jury specified the instrument that immediately caused the death, and its value, that the king might claim the deodand; for it was no deodand unless it was so found by the jury. Though these forfeitures were originally incurred to the king, yet they were usually granted to the lord of the manor or territory upon which the death happened, as was also the case with the right of waifs and wrecks. It is not surprising that so whimsical a law used to be very negligently executed; the juries were very apt to mitigate the forfeitures by finding that only some trivial thing, or only a part of an entire thing, was the occasion of the death; and the court generally refused to interfere in behalf of the lord of the franchise, to assist him in enforcing his claim to the whole article. Deodands were abolished by Act 9 and 10 Vict. cap. lxii. (Aug. 18, 1846).

DEODAR. See CEDAR.

D'ÉON DE BEAUMONT, CHARLES GENEVIÈVE LOUISE AUGUSTE ANDRÉ TIMOTHÉE, equerry to Louis XV., chevalier, doctor of law, parliamentary advocate, military officer, royal censor, diplomatist, &c., known until 1777 by the name of the *Chevalier d'Éon*, was born at Tonnerre, in 1728. His brilliant qualities enabled him to act a conspicuous part in the world, but he gained a greater notoriety by the mystery long kept up in regard to his sex. While an advocate, he studied, in his leisure hours, politics and belles-lettres, and wrote an Essai historique sur les différentes Situations de la France, par Rapport aux Finances, followed by two volumes, entitled Considérations politiques sur l'Administration des Peuples anciens et modernes. To these works he owed the honour of being proposed by the Prince of Conti, minister of Louis XV., as envoy on a difficult mission to the Russian court. Here his insinuating manners gained him the favour of the Empress Elizabeth, and for five years he was the medium of a secret correspondence between her and the King of France. He returned to France in 1758, and subsequently distinguished himself in the Seven Years' War. After the conclusion of peace he went to London as secretary of legation, under the Duke of Nivernois, and obtained possession of some important papers. On the return of the duke he remained as resident, and afterwards as minister plenipotentiary in London. Everything seemed to favour him, when secret intrigues suddenly disappointed his fair prospects. France had concluded a disadvantageous peace with England, and the negotiators of it were fearful of having their conduct exposed. The chevalier was the confidant of Louis XV., and might make the dreaded disclosures. This was reason enough for ruining him. He was dismissed from his employment, and lived fourteen years at London in a kind of banishment. In 1777 he returned to France, but the king imposed on him the obligation of assuming female attire, and he now styled himself La Chevalière d'Éon instead of Le Chevalier d'Éon. He returned to England in 1783. Meanwhile the French revolution broke out, and deprived him of his pensions; upon which he returned to France, offered his services to the National Assembly in 1792, was rejected, went back to England, and was put as an absentee on the emigrant list. From this time misfortunes crowded upon him. He lived in great poverty, and attempted to support himself by giving lessons in fencing, but was not very successful, and depended in a great measure for subsistence on the aid of his friends. Among these was Elisée, first surgeon of Louis XVIII., who aided him till his death in London, in 1810. In 1775 appeared the Loisirs du Chevalier D'Éon, in fourteen vols. 8vo.

DEPARTMENT, the name given to the principal territorial divisions of France. At the time of the French revolution, when the former division of the kingdom into provinces was abolished, and succeeded by a division of it into departments, this division was determined partly by the number of inhabitants, partly by extent of territory, and partly by the amount of direct taxes. The new division was proposed in the Constituent Assembly in 1789, and effected in 1790. The whole kingdom was at first divided into eighty-three departments, which were subsequently increased by the gradual extension of the empire to 130, and were reduced by the peace of 1814 to eighty-six. By the cession of Savoy and Nice to France in 1860 the number of the French departments was increased to eighty-nine, and by the cession of Alsace-Lorraine to Germany in 1871, the number was reduced to eighty-seven. Most of the states of South America are also divided into departments (*departimientos*), but these resemble the French ones in nothing but the name. Each French department is subdivided into arrondissements, these again into cantons, and these again into communes.

DEPILATORIES, or EPILATORIES, applications used to remove the hair from the body, especially the face and scalp, without injuring the texture of the skin. The most celebrated depilatory is the Rusma used by oriental nations, which consists of quicklime and orpiment (tersulphuret of arsenic) boiled in water impregnated with a strong alkaline lye. The parts which are to be deprived of hair are rubbed with this mixture, and after a time washed in warm water. This depilatory acts with great energy, and the utmost care is necessary in using it that it may not irritate and injure the skin. Sometimes a plaster of pitch and rosin is used for the same purpose.

DEPLOY, to display, to spread out. A column is said to deploy when the divisions open or extend to form line on any given division.

DEPONENT, in grammar, a verb passive in form but active or neuter in signification. In Latin such verbs have both the participles belonging to the active and those belonging to the passive form. *Hortor*, I exhort, for example, has the participles *hortans*, exhorting; *hortaturus*, about to exhort; *hortatus*, having exhorted, and the gerundive *hortandus*, to be exhorted (the last with a passive sense).

DEPOSIT, in law, a contract by which anything belonging to one person is intrusted to the safe-keeping of another, to be kept without fee, and to be re-delivered on demand. The contract is completed by simple delivery. The person who makes the deposit is called the depositor, and the person who receives the deposit is called the depositary. By the civil law, deposits are divided into two classes, necessary and voluntary. The first class is where the depositor is compelled by some sudden emergency, such as fire or shipwreck, to confide his property to some one, without having opportunity for choosing his depositary. The second class is where the deposit is made by the mutual consent of the parties. To these a third kind is added, called involuntary deposits, where the deposit may be made without the assent and even without the knowledge of the depositor, as when his goods are left on another's land by the subsidence of a flood, or an unusually high tide. Another division of deposits made by civilians is into simple deposits and sequestrations. The former are deposits made by a single person, or by two or more persons having a common interest: the latter are deposits made by two or more persons, each of whom has a different and adverse interest in the article deposited, or deposits made by one person of articles which are claimed by more than one. The latter are again divided into conventional, when the sequestration is made by agreement between the interested parties; and judicial, when they are made by order of a court. In Scotch law, deposits (or depositations, as they are also called) are divided into proper and improper. Proper deposits are those in which the very articles deposited are to be returned on demand to the depositor; improper deposits are those in which the articles deposited, whether money or any other thing, need not be themselves re-delivered to the depositor, but must be returned in kind. The latter are called in English law irregular deposits. In the case of proper deposits, the depositor's claim to the articles deposited is indisputable: the depositor is not regarded as among the ordinary creditors of the depositary, but he has a right to have the articles deposited set apart from the common stock of the depositary, and returned to him intact, without regard to the claims of the other creditors. In the other case, however, the depositor merely ranks with the ordinary creditors. As long as an article is in the hands of a depositary without being re-demanded by the depositor, the depositary is only liable for gross negligence; and if the article is destroyed accidentally, the loss is borne by the depositor. But if there is any undue delay in returning the article after it has been demanded, the depositary is responsible, and has to bear the loss in case the article is destroyed, even though it be destroyed accidentally. When a box or other repository is deposited without the key, the depositary is only responsible for the repository, not for the contents; but if the key is also deposited, then he is responsible for the contents also in the same degree as he is responsible for the repository. When an article is deposited with a person who is already the creditor of the depositor in some other way, he is not entitled to retain the article deposited as a pledge for what the depositor owes him; but when the depositary has suffered any loss on account of the article which he had in safe-keeping from the depositor, he is not required to return the article until he has received full compensation for such loss.

DEPOSIT, in geology, a layer of soft or hard matter formed by the settling down of mud, gravel, stones, detritus, organic remains, &c., which had been held in suspension in water. Marine deposits are those formed on sea bottoms; lacustrine, those formed at the bottoms of lakes; fluviatile, those formed on river bottoms; and so on. See GEOLOGY.

DEPOSITION, in law, testimony given in court by a witness upon oath. It is also used to signify the attested written testimony of a witness by way of answer to interrogatories. These interrogatories are usually put in writing, and must be short and pertinent, and not such as will lead the witness to give a turn to his answer favourable to one of the parties. The witnesses are examined before magistrates having a general authority given them by statute to take depositions, or commissioners appointed by the court which has cognizance of the case. If the witnesses are foreigners, residing beyond sea, they are examined upon oath through skilful sworn interpreters. The deposition of a heathen, who believes in the Supreme Being, taken by commission according to the forms used in his country in giving evidence, is admissible. By the practice of some countries the commissioners are sworn to secrecy, and the deposition cannot be made public till the papers containing it are opened in court. After a witness is fully examined the examinations are read over to him, and he is at liberty to alter or annul anything; and then the examinations are complete.

Depositions are frequently taken conditionally, or *de bene esse*, as it is called; for instance, when the parties are sick, aged, or going abroad, depositions are taken, to be read in court in case of their death or departure before the trial comes on.

DE PROFUNDIS, in the liturgy of the Roman Catholic Church, one of the seven penitential psalms, the 130th of the Psalms of David, which in the Vulgate begins with these words, signifying 'Out of the depths.' It is sung when the bodies of the dead are committed to the grave.

DEPTFORD, a town and naval arsenal, England, in the counties of Kent and Surrey, on the right bank of the Thames, 4 miles east of London, at the mouth of the Ravensbourne. It is irregularly built, but paved and lighted with gas, and well supplied with water. It has four Established churches and several Dissenting chapels; free and other schools, a dispensary, a savings-bank, a mechanics'-institute, and two hospitals belonging to the Trinity House corporation, one of which was founded in the time of Henry VIII. The pensioners in both these hospitals consist of decayed pilots and masters of ships, or their widows. The royal dockyards, for which Deptford is so celebrated, were established by Henry VIII. They comprise a space of 31 acres, within which are large workshops of all descriptions requisite for fitting out

ships of war, several ranges of storehouses, and the victualling office. Ship-building was given up and the dockyard closed in March, 1869. The manufactures include anchors and steam-engines for the merchant service, pottery, ropes, chemicals, and soap. Deptford unites with Greenwich, Woolwich, &c., in returning two members to the House of Commons. In Sayes Court, the mansion of the Evelyns, the Czar, Peter the Great, resided, while studying naval architecture in the dockyard. Pop. 52,821.

DEPUTIES, CHAMBER OF (*Chambre des Députés*), the lower of the two legislative chambers in France, under the restoration and the government of July, between 1814 and 1848. By the *Charte constitutionelle*, the constitution promulgated for France under Louis XVIII. in 1814, the right of voting for deputies to this chamber belonged to all citizens who had reached the age of thirty, and who paid at least 300 francs (£12) of direct contributions, and no one could be returned as a deputy unless he had completed his fortieth year, and paid at least 1000 francs (£40) of direct contributions; but the *Charte* of 1830, accepted by Louis Philippe, reduced the qualification for a voter to 200 fr. (£8), and the age of the voter to twenty-five, and reduced the qualification for a deputy to 500 fr. (£20) and the age to thirty. At first the chamber of deputies was elected for five years, and a fifth part of it was to be renewed every year; but in the year 1824 it became septennial, and the mode of electing the whole chamber at once was adopted. The first election according to this arrangement took place in 1827. In 1830 the duration of the legislature was again reduced to five years. The president of the chamber, who was appointed by the king under the restoration, was afterwards elected every session by the deputies themselves. The number of the deputies, which was 262 in 1815, was increased to 434 in 1820, and to 459 in 1830. The deputies arranged themselves in the chamber (as they had done in the National Assembly of 1789) according to their political views; those favouring the royal prerogative took their seats on the right hand of the president; those who favoured the popular ascendency, on the left; and those who gave a general support to the ministers, in the centre. Hence arose the phrases *côté droit* (right side), *côté gauche* (left side), and *centre*, which was subdivided into *centre droit* and *centre gauche*. There were twelve chambers of deputies between 1814 and 1848, the last of which was overthrown by the revolution of February, 1848.

DE QUINCEY, THOMAS, a well-known English author, was the son of a Manchester merchant, and born at Greenhay, his father's residence (from which Greenheys, now a suburb of Manchester, takes its name), on 15th August, 1785. He was a boy of remarkably quick and precocious abilities, and made so great proficiency in classical studies, that the master of the school which he attended pointed him out on one occasion to a stranger with the remark, 'That boy could harangue an Athenian mob better than you or I could address an English one.' In 1793 he had lost his father, who died of consumption at the age of thirty-nine, leaving his family a fortune of £30,000. After attending a succession of schools young De Quincey was extremely urgent with his guardian to send him to the University of Oxford; and his importunities proving unsuccessful, he ran away from the Manchester grammar-school with ten guineas and a volume of Euripides in his pocket. He directed his steps first to North Wales, and afterwards wandered up to London, where he arrived in May, 1800, in an absolutely destitute condition, with his store of money exhausted, and not a friend to whom he could apply. For sixteen weeks he roamed through the streets of the metropolis, unprovided with food or shelter, except such as was furnished him by charitable persons. On one occasion, overpowered by the pangs of hunger, he fainted away in Soho Square, and was restored to consciousness by an unfortunate, but kind-hearted girl, who administered to him a tumbler of spiced wine. Circumstances at length occurred which effected his return to his family; and after returning to school for some time, and paying visits in different parts of England and Ireland, he matriculated in 1803 at Oxford, where he remained till 1808. Having been afflicted with rheumatism in the autumn of 1804, he was induced to alleviate the pain by doses of opium, and a foundation was thus laid of a pernicious habit, which in his case, as in that of Coleridge, proved extremely deleterious both to physical and mental health. For the first ten years, however, of his addiction to the practice, the evil results were not perceptible, and in the possession of a sufficient fortune, a genial circle of friends, and freedom from bodily ailments, he spent the life of a learned and speculative voluptuary. In 1804 he had first become acquainted with Charles Lamb, and in 1807 with Coleridge, to whom he conveyed, by the hand of a mutual friend, a present of £300. In 1809 he took a lease of the cottage of Grasmere, Westmoreland, which had previously been occupied by Wordsworth, and there, in that beautiful locality, and the neighbourhood of Wordsworth, Southey, and other literary friends, he continued to reside for upwards of twenty years. In 1813 a severe derangement of his stomach forced him to increase his doses of opium, which he now took regularly every day. In 1816 he married; and in 1821, making a strong effort to shake off his habitual indolence, he commenced his Confessions of an English Opium Eater, which appeared in the London Magazine for that year, and were published in a collected form in 1822. He subsequently contributed on numerous occasions to Blackwood and Tait's Magazines, and also wrote various articles for the Encyclopædia Britannica. In 1843 he took up his abode in a cottage at Lasswade, Mid-Lothian, the same which many years before had been occupied as a summer residence by Sir Walter Scott, and here he remained to the end of his life. A few months, however, before his death, he removed to Edinburgh for the purpose of superintending the publication of a collected edition of his works by Messrs. Hogg. This edition contains fourteen volumes. An edition of fifteen volumes was published by the Messrs. Black, Edinburgh, in 1867, to which a sixteenth was added in 1871. Among the writings by De Quincey which have not yet been published among his collected works are Walladmor, a novel, based upon a German one, which was itself professedly a translation of a novel of Sir Walter Scott's (Lond. 1824); another novel, Klosterheim (Edin. 1829); and the Logic of Political Economy (Edin. 1844). He died there on 8th December, 1859.

DERA GHAZEE KHAN, a town in Hindustan, in the Punjab, in the district of Derajat, on a low flat about 4 miles from the right bank of the Indus, and 40 miles south-west of Mooltan, lying at the meeting-point of the roads leading from India and Beloochistan. It is ill built and dirty, but has a bazaar with 1600 shops; extensive manufactures of coarse cutlery, silk and cotton goods, and a kind of mixed fabrics called *loongees;* and some trade in fruit, sugar, cotton, and indigo. Pop. about 25,000, half Hindus and half Mohammedans.

DERA ISMAEL KHAN, a town in Hindustan, in the Punjab, in the district of Derajat, 128 miles north of Dera Ghazee Khan. It is well laid out, but ill built of unburned brick. It is a staple place for cotton goods, and also for grain and salt. The

caravan trade is in the hands of the Lohanis, an Afghan tribe who inhabit the mountainous districts on the right bank of the Indus, and who are described as real business men. Pop. about 8000.

DERAJAT, a district of Hindustan, forming a portion of the Punjab to the west of the Indus, and lying between that river and the Sulliman Mountains. It is well watered, is one of the most fertile districts in the world, and contains numerous towns and villages. It takes its name from its three chief towns, each of which has the prefix Dera, signifying a camp; they are Dera Ghazee Khan, Dera Ismael Khan, and Dera Fatteh Khan.

DERBEND, or DERBENT, a town in Daghestan, in the viceroyalty of Caucasian Russia, on the west shore of the Caspian, with 15,739 inhabitants. It is pleasantly situated on a slope above the sea, and is surrounded by massive walls built of large square stones, and defended by a citadel. It was long considered the key of Persia in this direction, but is now in a dilapidated state. A hut inhabited by Peter the Great in 1722 stands on the shore, and is carefully preserved. In 1848 it was encircled and adorned with pilasters and chains, and defended by a couple of cannon. The manufactures consist of woollen stuffs, copper and iron ware, rose water, &c.; and there is some trade in saffron, largely grown in the vicinity.

DERBY, an ancient borough and market town in England, capital of Derbyshire, situated on the right bank of the Derwent, here crossed by an elegant bridge of three arches, 115 miles N.N.W. London direct, and 60 miles S.S.E. Manchester, at the centre of the Midland Railway system. It is pleasantly situated in a wide and fertile valley, open to the south, and, where modern, is well and regularly built; but in the older quarters the streets are narrow and winding. Most of the private houses are of red brick; the public edifices are of stone. Of these the most important are the church of All Saints, on the east side of the town, near the river, a large and handsome edifice, in Roman Doric, light and airy in the interior, which contains some interesting monuments, and has a beautiful screen of rich open iron work, and is surmounted by a beautiful pinnacled tower, erected in the latest style of Gothic about the time of Henry VIII., and nearly 180 feet high; the church of St. Alkmund, of florid Gothic, with a tower at the west end, terminating in a beautiful spire 207 feet high; the church of St. Werburgh, consisting of a nave, chancel, and aisles in the Tuscan style, with a fine Gothic tower and good organ; the town-hall, a handsome edifice, with a bell-tower; the county hall, assembly rooms, theatre, the athenæum (including the post-office), the infirmary, and jail, the last well arranged, and provided with every convenience for classifying the prisoners. The principal educational establishment is the free grammar-school, one of the oldest endowments in the kingdom, and having ten exhibitions to Emmanuel College, Oxford. A handsome building has been erected for a normal female school. There is also a free library. A Philosophical Society was founded in the town by Dr. Darwin. The benevolent institutions include a number of almshouses and hospitals. A corn exchange was erected in 1861, and a fine large market hall in 1866. One of the most valuable possessions of Derby is its arboretum, which it owes to the munificence of its citizen, Joseph Strutt, who presented it in 1840. It originally covered 11 acres of ground, to which five additional acres have since been added, and has been tastefully laid out in walks, and planted with trees and shrubs, so as to combine instruction with amusement. A 'crystal palace' has been added to it for flower-shows and other exhibitions. A recreation ground of 6 acres was presented to the town by Mr. M. T. Bass in 1867.

The principal manufactures of Derby are silk, cotton, paper, porcelain, railway-carriages, jewelry, and ornamental articles made of various kinds of spar, particularly of the fluor-spar called 'blue John,' red and white lead, lead pipe, sheet-lead, cast-iron, ribbed stockings, bobbin-net, and other lace. There are also several printing and publishing establishments. Silk-throwing, introduced into Derby at the beginning of last century by a mechanic named Lombe, who brought the art from Italy, is still carried on here to a great extent. The weaving of piece-goods in silk was introduced about 1823 or 1824. Since then sarsanets, gros-de-naples, and other rich silks of superior quality, continue to be manufactured to such an extent that silk tissues have become the staple of the town. The working of lace by machinery is also a thriving business. The porcelain or china manufacture was introduced about the year 1750, and has since attained a degree of excellence unsurpassed anywhere else, either as to fineness of material or brilliancy of colouring. It is now, however, in a somewhat declining state. The spar manufactories are curious and interesting. There are also a patent shot manufactory, some extensive foundries, and iron and tin forges, where malleable iron bars, sheet-plates, tin-plates, &c., are formed and manufactured into steam-boilers, gasometers, &c. The materials for the lead works are brought from the Peak Hills. Derby is one of the oldest towns in the kingdom, and is supposed to owe its origin to a Roman station, Derventio, situated at Little Chester, on the opposite side of the river, where the foundations of a Roman bridge still exist, and various coins and other antiquities have been found. In the time of the Saxons it was called Norworthige, and under the Danes took that of Deoraby, which, with a slight change, it still retains. In Dec. 1745, it was the furthest limit reached by Prince Charles Edward in his southward march into England. Richardson, the novelist, was a native of the town. Derby returns two members to Parliament. Pop. (1871), municipal borough, 49,810; parliamentary borough, 61,381.

DERBY, EDWARD GEOFFREY SMITH STANLEY, FOURTEENTH EARL OF, an English statesman, born at Knowsley Park, Lancashire, March 29, 1799; died there October 23, 1869. In 1820 he was returned to the House of Commons as member for Stockbridge, in Hampshire, but for three or four years he remained quite silent. His very first speech, however, marked him out as a skilled debater, and he rapidly rose to distinction in the house. His views at first inclined him to side with the Whig party. In 1827 he joined Canning's ministry as under secretary for the colonies; and as a member of Lord Grey's government he took a leading part in the debate in favour of the reform bill in 1831–32. The post he held was that of chief secretary for Ireland. In this post his task was a difficult one. Ireland was then in one of the most turbulent periods of its history. The opposition, led by O'Connell in the House of Commons, was powerful and violent; but while he firmly resisted the extravagant demands of the opposition, and the agitation for the repeal of the union, he succeeded in passing a number of measures which tended to lessen the prevailing discontent. He improved the administration of justice, carried a bill establishing a system of national education, and afterwards, as secretary of state for the colonies (to which office he was appointed in 1833), he supported the bill for the reform of the Irish Church, by which two archbishoprics and ten bishoprics were abolished, and considerable reductions were made in the ecclesiastical taxation of Ireland. He also gave his warm support to the petitions which were presented to Parliament for the abolition of slavery in the British colo-

nies, and was successful in passing the act for this purpose in 1833. In the following year he split with the Whig party on the question of the appropriation of the surplus revenue of the Irish Church to the purposes of education, and resigned his office. He now joined the Tories; and on the fall of the Melbourne ministry in 1841 he accepted office under Sir Robert Peel, being again appointed colonial secretary. He distinguished himself by his wise administration of this department during the four following years; but in November, 1845, when Peel proposed to repeal the corn-laws, he laid down his office, being an unyielding opponent of that measure. In 1851 and 1858 he was commanded by the queen to form a ministry, but on both occasions he had to contend against a majority in the House of Commons, and was able to maintain himself in office only for a short period. He was more successful in 1866, when, on the defeat of Lord John Russell's government on one of the chief clauses of their reform bill, he undertook to form a ministry. His administration on this occasion was signalized by the reform of the government in India, the successful conduct of the Abyssinian war, and the passing of the reform bill, which introduced household suffrage as the qualification for the electoral franchise. This was the last important act of his political life. The act was passed in 1867, and early in 1868, owing to failing health, he resigned office, recommending Disraeli as his successor. Earl Derby joined to great ability as a statesman, and brilliant oratorical powers, a high degree of scholarly culture and literary ability. Among other works he published a successful translation of Homer's Iliad (London, two vols. 1864).

DERBY-DAY, the great annual London holiday, on which the horse-race for the stakes instituted by Lord Derby in 1780 is run. It always falls on a Wednesday, being the second day of the grand spring meeting, which takes place in the week after Trinity Sunday. The race is run on Epsom Downs, an extensive plain in the neighbourhood of London, admirably adapted for the purpose. The entry-money for each subscriber is fifty guineas, and the stakes are run for by colts of three years. In the first year of the Derby there were only thirty-six entries, but now they are so numerous that the value of the stakes reaches several thousand pounds. The Epsom races are the most popular of the English horse-races. The Ascot races are patronized by royalty, the world of fashion is to be seen at Goodwood, but on Epsom Downs, on the Derby-day, are assembled all classes, high and low. Among the working-classes parties are organized three months in advance to be present at the Derby. They make subscriptions among themselves to defray the expenses of the day. But the nobility and gentry are also very largely represented. The amount of betting on the horses engaged to run the Derby stakes is prodigious. Every horse which is considered as a 'favourite' (of which there are sometimes as many as ten) is said to represent at least £500,000 sterling. Not unfrequently the stakes are won by a horse which was not expected to win, and then the gains of those who had betted on it are immense. The owner of the Hermit, which gained the stakes in 1867, made £200,000 by the victory.

DERBYITES. See PLYMOUTH BRETHREN.

DERBYSHIRE, a county of England, situated about the centre of the kingdom; about 55 miles long, and from 15 to 25 broad; area, 656,243 statute acres, or 1025 square miles. It in general exhibits much varied and romantic scenery; the southern and eastern parts enjoy a temperate, healthy, and pleasant atmosphere: and the soil is rich and fertile, producing abundantly various kinds of grain, and particularly excellent crops of barley. The north-western portion, including the district of the Peak, is of a widely different character, the climate being bleak and changeable, and the face of the country rocky and irregular. The mountains of the Peak constitute the loftiest and most considerable range of hills in the midland regions of the kingdom. About 700 eminences, and fifty rocky caverns, dells, and valleys, with mineral and other springs, are enumerated by Mr. Farey in his survey of this county: these have been repeatedly celebrated, both in verse and prose, under the title of the 'Wonders of the Peak.' The principal river in Derbyshire is the Derwent, which, rising in the High Peak, runs southward, and passing Derby falls into the Trent on the borders of Leicestershire; the Trent itself crosses the southern extremity of the county, and for a short distance divides it from Leicestershire and Nottinghamshire; other rivers are the Dove, the Wye, the Erwash, and the Rother. Oats are the principal crop in the north and hilly districts, but the land there is mostly in pasture; and both in the north and south dairy-husbandry is carried on to a large extent, upwards of 2000 tons of cheese being annually sold out of the county. In the south wheat is cultivated. The total acreage under wheat in 1872 was 31,104 acres, and under oats, 28,975. In the High Peak considerable numbers of sheep are reared, of a small size. The horses of the north parts are of a different breed from those of the south; the latter being strong and heavy, while the former are light and slender, and are much employed in the Peak for carrying limestone, their agility in ascending and descending the steep mountains being remarkable. The mountainous ridges of the Peak, exteriorly bare and unproductive, make amends for this sterility by the mineral riches contained beneath their surface. Coal is abundant in various parts of the county; the whole coal-field is calculated to extend to 190,000 acres. Among the metals lead was formerly the most plentiful, but many of the mines are exhausted; iron and antimony are also found here; the fluor or Derbyshire spar is wrought into vases, urns, and many ornamental articles; gypsum or alabaster, marble, limestone, and stone for various purposes, are procured from the mines and quarries in this county. In the mountainous districts tepid mineral springs are numerous; the most celebrated are those of Matlock, Buxton, and Bakewell. There are also calcareous springs, which incrust wood and other substances immersed in them. The manufactures of Derbyshire are very considerable, especially of silk and cotton; the chief seat of the latter being the parish of Glossop, in which are more than half the mills in the county. There are numerous factories for the weaving and printing of calico, some bleaching grounds, and factories for weaving cambric, fustian, muslin, and tape, and for making candle-wicks. Machinery, stocking-frames, and agricultural implements are also largely manufactured. There are also numerous tanyards and paper-mills in different parts of the county. Hats are made for exportation, and a superior porcelain is manufactured at Derby. The county is intersected by numerous canals and railways; the principal of the former is the Trent and Mersey Canal, the latter comprise various branches of the Midland Railway. Previously to 1867 Derbyshire was divided into two divisions, each of which returned two members to Parliament. By the reform bill of that year it is now divided into three, North, South, and East Derbyshire, each with two members. Pop. in 1861, 339,327; in 1871, 379,394.

DERBYSHIRE SPAR. See FLUOR-SPAR.

DERECSKE, a market town in Hungary in the county of Bihar. It contains a Protestant and a Roman Catholic church. In the neighbourhood are

four lakes, from which, by the evaporation of the water in summer, a good deal of soda is obtained; and another lake, called Fingoto, celebrated from the earliest times for its baths. In the same locality pearls are found, which, though small, are equal in beauty to those of the East. Pop. 7334.

DEREHAM, East, a town in England, in the county of Norfolk, beautifully situated on a rivulet, nearly in the centre of the county, 15 miles north-west of Norwich. It is now considered one of the handsomest market towns in Norfolk, although at one time one of the dirtiest. It consists chiefly of a spacious market-place, and three long, straight, and well-kept streets. The poet Cowper was interred in the church, which is an ancient structure in the collegiate style, with a central tower. The manufactures comprise mill machinery, agricultural implements, carriages, sacks, beer, and malt. There are two iron-foundries, and a brisk trade is carried on in cattle and grain. Pop. in 1871, 3689.

DERELICT, anything abandoned at sea. A ship is derelict either by consent or by compulsion, stress of weather, &c., and yet, to save the owner's rights, if any cat, dog, or other domestic animal be found on board alive, it is not forfeited. The owner may yet recover, on payment of salvage, within a year and a day—otherwise the whole may be awarded.

DERG, Lough, a lake, Ireland, county of Donegal, about 3 miles long by 2½ broad at the broadest part, and studded with islets, one of which, called Station Island, is famous for the pilgrimages made to it by Roman Catholic devotees, to the number of from 10,000 to 15,000 annually, between the 1st and the 15th of August. The scenery around is wild and desolate.

DERHAM, William, a philosopher and divine, born at Stoughton, near Worcester, in 1657; entered Trinity College, Oxford, in 1675, and became, in 1685, vicar of Wargrave, in Berkshire, and in 1689 rector of Upminster in Essex, where he spent the remainder of his life, and died in 1735. Though small in stature, distorted, and of ungainly appearance, he had a highly gifted mind, and not only possessed the universal esteem of his parishioners, but acquired considerable reputation in various departments of literature. His best-known works, entitled Physico-Theology, Astro-Theology, and Christi-Theology, are expansions of sermons which he preached at the celebrated Boyle's lecture.

DERIVATION. See Etymology.

DERMESTES, a genus of coleopterous insects, the type of the family Dermestidæ. The larvæ of this genus are covered with slippery hairs. They devour dead bodies, skins, leather, and other animal substances. One species (*Dermestes lardarius*) is known by the name of bacon-beetle, and is often found in ill-kept ham or pork shops. Many insects, the larvæ of which have similar habits to those of the true Dermestes, sometimes receive that name, although they really belong to the genera *Attagenus*, *Necrophorus*, *Nitidulus*, &c.

DERMOT MAC MURRAGH, the last King of Leinster, before the sovereignty was assumed by Strongbow, in the reign of Henry II. of England. He became King of Leinster in 1140, and having carried off the wife of O'Ruarc, Prince of Leitrim, he was attacked by the latter, and after a contest which lasted for some years, he was driven from Ireland in 1167. He betook himself to Aquitaine, where he did homage to the English king, who granted him permission to enlist adventurers in England, to aid him in recovering his kingdom. He received the aid of Richard de Clare, earl of Pembroke, usually called Strongbow, who married his daughter Eva in 1170. With his aid he proved victorious, but when he died in the same year his kingdom was assumed by his son-in-law.

DEROSNE, Charles, was a native of Paris. He was an apothecary and member of the Medical Society. He executed several investigations alone and with his brother, and devised a still for the rectification of alcohol so arranged that instead of the weaker aqueous spirit which distilled being completely condensed by cold water, it was condensed by water only a little under the boiling-point of the mixture, so that while the alcohol still remained as vapour, a large proportion of the watery vapour was condensed, and thus the distillate was made stronger. This apparatus is called by his name. His most important research was into the composition of opium, in the course of which he isolated a crystalline body, long distinguished as Derosne's salt. He himself did not determine its character, and it was not till some years later that it was distinguished as an alkaloid by Robiquet, and called by him narcotin, the name by which it is now known. He was the first to introduce animal charcoal for decolorizing syrup. He died at Paris in 1846.

DERRICK, a nautical term applied to a single spar supported by stays and guys, to which a purchase is attached, used in loading and unloading vessels. The name has also been applied to a kind of floating crane, or mechanical contrivance which acts like a crane, but which is able to lift much heavier weights than an ordinary crane, and is used for lifting vessels out of the water for repairs, raising wrecks, fixing machinery, &c. It consists of a wide pontoon divided into watertight compartments, with a stout tripod-mast in the centre, with a single mast or king-post rising above the union of the feet of the tripod-mast. A strong yard or boom is supported by this mast, and bears on one arm a number of fourfold blocks, in which runs the tackling by means of which the weight is lifted. The tackling, after passing through these blocks, passes first over the king-post, and then over a pulley at the other end of the boom, and is connected with a steam-engine in the pontoon, which supplies the power by which the weight is raised. In order to counterbalance the weight on one side of the pontoon, water is admitted into as many of the compartments as necessary on the other side. The derrick is capable of being propelled at a slow rate.

DERRY. See Londonderry.

DERVISH, or Dervise (Persian, poor), the name of a certain class of religious persons in Asia. It denotes the same amongst Mohammedans as *monk* with the Christians. The observance of strict forms, fasting, and acts of piety, give them a character of sanctity amongst the people. They live partly together in monasteries, partly alone, and from their number the Imams (which see) are generally chosen. Throughout Turkey they are freely received, even at the tables of persons of the highest rank. Among the Hindus these monks are called *fakirs*. There are, throughout Asia, multitudes of these devotees, monastic and ascetic, not only among the Mohammedans, but also among the followers of Brahma. There are thirty-two religious orders now existing in the Turkish Empire, many of which are scarcely known beyond its limits: but others, such as the Nakshbendies and Mevlevies, are common in Persia and India. All these communities are properly stationary, though some of them send out a portion of their members to collect alms. The regularly itinerant dervishes in Turkey are all foreigners or outcasts, who, though expelled from their orders for misconduct, find their profession too agreeable and profitable to be abandoned, and therefore set up for themselves, and, under colour of sanctity, fleece honest people. All

these orders, except the Nakshbendies, are considered as living in seclusion from the world; but that order is entirely composed of persons who, without quitting the world, bind themselves to a strict observance of certain forms of devotion, and meet once a week to perform them together. Each order has its peculiar statutes, exercises, and habits. Most of them impose a novitiate, the length of which depends upon the spiritual state of the candidate, who is sometimes kept for a whole year under this kind of discipline. In the order of the Mevlevies, the novice perfects his spiritual knowledge in the kitchen of the convent.

The numerous orders of dervishes are all divided into two great classes, the dancing and the howling dervishes. The former are the Mevlevies, and are held in much higher estimation than the other class, and are the wealthiest of all the religious bodies of the Turkish Empire. Their principal monastery is at Konieh, but they have another at Pera, a suburb of Constantinople, where they may be seen engaged in their exercises every Wednesday and Thursday. These are performed in a round chamber, in the centre of which sits their chief or sheik, the hem of whose garment each dervish reverently kisses on entering the chamber, after which they go and range themselves round the chamber with their legs under them. When all the dervishes have entered and saluted the sheik, they all rise together and go in procession three times round the room, the sheik at their head. Each time they do obeisance to the empty seat of the sheik on coming to a certain part of the room. The procession ended, the sheik again takes his place in the centre, and all the others begin dancing round him, turning on themselves at the same time that they move round the room, while sounds of music are heard from a neighbouring gallery. The movement at first is slow, but as the dervishes become excited it grows in animation, until at last the actors are exhausted, and are obliged to sit down. After a while they rise up again and resume their dancing, which is repeated several times. The whole is concluded by a sermon. The howling dervishes do not confine themselves in their exercises to the dancing just described. They accompany them with loud vociferations of the name of Allah, and violent contortions of the body such as are seen in persons seized with epileptic fits. And even these extravagances are not so bad as those which were formerly practised, when the dervishes, after working themselves up into a frenzy, used to cut and torture themselves in various ways with apparent delight. The sheiks of all orders have the credit of possessing miraculous powers. The interpretation of dreams, the cure of diseases, and the removal of barrenness, are the gifts for which the dervishes are most in repute.

DERWENT, a river in Tasmania, which flows out of Lake St. Clair, in the county of Lincoln, near the centre of the island. It flows in a south-easterly direction, has a very tortuous course, and latterly expands into a spacious estuary, opening to the South Pacific Ocean. A lighthouse, elevated 70 feet above the sea, has been erected on Iron Pot Island, at the entrance of the Derwent, exhibiting a fixed light, which may be seen from 12 to 15 miles distant from a ship's deck.

DERWENT WATER, or the Lake of Keswick, a beautiful lake in the county of Cumberland, England, in the vale of Keswick, lying between the mountain of Skiddaw on the north, and the craggy hills of Borrowdale on the south, whence it derives its chief supplies of water. This lake, considered to be the finest in the north of England, is about 3 miles in length, and 1½ in breadth. The waters of this lake are sometimes liable to an unaccountable agitation, and frequently, even in the calmest weather, continue in this state for hours together. Near the north-east corner of the lake is the celebrated cascade of Lodore.

DERWENTWATER, James Ratcliffe, last Earl of, one of the leaders in the rebellion of 1715, born in London June 28, 1689; beheaded on Tower Hill, February 24, 1716. His grandfather had been created Earl of Derwentwater by James II., and his father, Francis, married a natural daughter of Charles II. The subject of this biography (who succeeded to the title in 1705) hence entertained a personal attachment towards the Stuart family, which induced him to take part in the attempt to restore them to the English throne. The standard of revolt having been raised in Scotland, Lord Derwentwater, at the instigation of his wife, it is said, commenced the movement in England on the 6th of October, 1715. The death of Louis XIV., which took place in September in the same year, had deprived the supporters of the Pretender of all hope of aid from France, and the ranks of his army were slow in filling. The cause of the Pretender was thus a losing one from the first, and in spite of the energy and courage displayed by the Earl of Derwentwater and other Jacobite nobles, they were compelled to surrender at discretion at Preston on the 13th of November, 1715. The Earl of Derwentwater being impeached of high treason pleaded guilty, and was condemned to be executed. His estates were confiscated, and were given to Greenwich Hospital by an act passed in 1735 in the reign of George II.

DERŽAWIN, Gabriel Romanowicz, a Russian lyric poet, born at Kasan in 1743, after studying in the gymnasium of his native town, was admitted by Count Schumaloff into a regiment of guards as a reward for his diligence in the military school, and the skill he had acquired as a designer and mathematician. He distinguished himself particularly in 1774, when he was sent against the rebel Pugatscheff, but his talents fitted him for a different kind of service, and he obtained rapid promotion in the civil service. In 1793 he was called to the senate, in 1800 was master of the imperial treasury, and in 1802 was minister of justice. The year following he was permitted to retire on full pay, and determined to devote himself entirely to the muses. His poetic talent had become early developed, and he is generally allowed to hold the first place among the poets who appeared during the reign of Catharine. He was an enthusiastic admirer of this empress, and he has celebrated her in his most brilliant odes. Of these, however, at once the most beautiful and the best known is his Oda Bog, or Address to the Deity, which, for sublimity both of thought and expression, has seldom been surpassed, and has been translated into most European languages. Almost all his poems are rich in true poetic beauties, though occasionally he indulges too much in gaudy oriental metaphor. He died at Novgorod, July 6, 1618. His works, containing, in addition to the Odes, several dramatic pieces and prose writings, were published at St. Petersburg, 1810–15. An edition of his works was published by the Academy of Sciences in 1864–65. The Memoirs which he had left behind him were not published till 1860.

DESAGUADERO, a vast depression or interalpine valley in Bolivia and Peru, between two huge ridges of the Andes into which the great chain divides, near the well-known city of Potosi. This great valley or table-land is about 400 miles in length, and varies from 30 to 80 miles in breadth. It comprises an area of 150,000 square miles, and includes the great Lake Titicaca, and the smaller Lake Aullagas or Uros.—Desaguadero is also the name of a river

issuing from Lake Titicaca, and flowing into Lake Aullagas. Also a river in the Argentine Confederation flowing into Lake Bevedero Grande, and separating the provinces of San Juan and Mendoza. Desaguadero signifies in Spanish 'a channel.'

DESAGULIERS, Jean Théophile, born at Rochelle in 1683, was brought over in infancy to England by his father, a French Protestant clergyman, whom the revocation of the edict of Nantes drove into exile. He was educated at Christ Church, Oxford, and succeeded Dr. Keill as lecturer on experimental philosophy at Hart Hall. He afterwards settled in London, and has the merit of being the first who read lectures to the public on natural and experimental philosophy. The novelty of this mode of teaching, and his ability as a lecturer, secured him large and often distinguished audiences, and he was repeatedly employed to lecture before the king and other members of the royal family. In 1714 he became a fellow of the Royal Society. As a clergyman, he was chaplain first to the Duke of Chandos, and afterwards to the Prince of Wales, and obtained two good livings. He died about 1743. His lectures were published in 1734 in two vols. 4to.

DESAIX DE VEYGOUX (or Voygoux), Louis Charles Antoine, a French general, who distinguished himself in the revolutionary war, was born in 1768 at St. Hilaire d'Ayat, a town in Auvergne, of a noble family, and entered the regiment of Bretagne as sub-lieutenant. In 1792 he was aide-de-camp to Victor de Broglie. He contributed, in December, 1793, to the capture of the Haguenau lines, which the left wing, where he was stationed, first broke through. He served in 1794 in the northern army under Pichegru, and repeatedly distinguished himself. Attached to the army of the Rhine, under Moreau, 1796, he defended the bridge of Kehl in November of that year. In 1797 he accompanied Bonaparte to Egypt, contributed to his first victory there, and was thence sent to the conquest of Upper Egypt, where Murad Bey, notwithstanding his defeat, incessantly harassed his conqueror. Bonaparte soon returned to Europe, as did Desaix himself after the Treaty of El-Arish, concluded by him with the Turks and English. On his arrival in France he learned that Bonaparte had departed for Italy, hastened to join him, and took command of the corps of reserve. A third part of the French army was already disabled when Desaix's corps arrived (June 14, 1800) on the field of Marengo. He immediately advanced to the charge, but fell, mortally wounded by a cannon-ball, just as victory declared for the French. His body was carried to Milan, embalmed, and conveyed to the hospitium on the St. Bernard, where a monument is erected to him. Another monument, erected to him on the plains of Marengo, where he fell, was destroyed by the Austrians in 1814. Desaix was as just and disinterested as he was brave. The inhabitants of Cairo gave him the title of the *just sultan*.

DESÂTÎR is the name given to a collection of sixteen sacred books, consisting of the fifteen old Persian prophets, together with a book of Zoroaster. This, at least, is what the book itself pretends to be. The collection is written in a language not spoken at present anywhere, and equally different from the Zend, the Pelvi, and modern Persian. The last of the fifteen prophets, Sasan, who lived at the time of the downfal of the Sassanides, when the Arabians conquered the country, literally translated the Desâtîr, and accompanied it with commentaries. This work was afterwards, until the seventeenth century, one of the chief sources of the ancient Persian religious doctrines, interwoven with astrology and demonology; and, after having been forgotten for about a century and a half, a learned Parsee discovered it at Ispahan. His son, Mulla Firuz Bin Kaus, was induced by the Marquis of Hastings to publish an edition of the Desâtîr at Bombay in 1818, to which Erskine added an English translation. Erskine, however, considers the collection as spurious; and Sylvester de Sacy (Journal des Savants, February, 1821) believes that the Desâtîr is the work of a Parsee in the fourth century of the Hegira, who, as he thinks, invented the language, in order to give to the collection, which is itself an assemblage of old traditions and significant mysteries, an air of genuineness. By some, however, it is considered as genuine. At all events, it is interesting to learn from this work, with greater accuracy, the old religious system of the East, Sabæism, in which are to be found, with pandæmonism and the metempsychosis, the elements of the worship of the stars, of astrology, the *theurgy*, the doctrine of amulets, as well as the elements of the Hindu religion, particularly the system of castes, and many peculiar oriental notions. Yet no trace of any connection with the Zendavesta and the magic of the Parsees has been found in the Desâtîr.

DESAULT, Pierre Joseph, one of the most celebrated surgeons of France, was born Feb. 6, 1744, at Magny-Vernais, in the former Franche-Comté. He was designed for the church, early studied mathematics and philosophy, and was led by his inclination to the surgical profession; in consequence of which he entered the military hospital at Béfort, where his diligence and talent for observation supplied the defects of a suitable instruction; and his situation was favourable for obtaining a knowledge of the treatment of wounds from fire-arms, in which department he afterwards rose to great eminence. He went to Paris in 1764, and was one of the numerous scholars of the celebrated Petit. Two years afterwards he became a lecturer, and though his delivery was bad, he soon became celebrated by introducing a new method of teaching anatomy. While lecturing on the parts of the human body, he treated of the diseases incident to each. After having been several years principal surgeon of the hospital De la Charité, where he increased his reputation by introducing new methods of treatment, or by improving and simplifying those already in use, he was put at the head of the great Hôtel-Dieu in Paris, in 1788. Here he founded a surgical school, in which have been educated many of the most eminent surgeons of Europe. His principal merits were, that he brought accuracy and method into the study of surgery; improved the treatment of fractured bones, by adopting improved bandages; first introduced into France the clinical method of instruction in surgery; and infused into his scholars a generous attachment to their profession. He was distinguished for the skill and boldness with which he performed operations. This happy natural talent, this surgical instinct that guided him in the most difficult cases, compensated his want of professional learning, to which he was so indifferent that in his later years he read very little; and as he was entirely ignorant of internal diseases he was indignant when, at the foundation of the École de Santé, in which he became professor of clinical surgery, the study of medicine and surgery were connected. He died while attending upon the son of Louis XVI., in the Temple, of a violent fever, June 1, 1795. Desault wrote only two small treatises; but the Journal de Chirurgie, in which his scholars published his lectures delivered in the Hôtel-Dieu, and the Œuvres Chirurgicales, edited by Bichat under Desault's name, contain his whole system.

DESCARTES, René (Renatus Cartesius), an original thinker and reformer of philosophy, with whom the modern or new philosophy is often considered as

commencing, was born March 31, 1596, at La Haye, in Touraine, and died at Stockholm, Feb. 11, 1650. While pursuing his education in the Jesuits' school at La Flèche, where he studied philology, mathematics, and astronomy, his superior intellect manifested itself. After having read much without coming to any certain conclusions, he travelled. Both his birth and inclination led him to embrace the military profession, and he served in Holland under Prince Maurice, and in Bavaria under the Duke of Bavaria, and was present at the battle of Prague in 1620. While he served in Holland, a mathematical problem in Flemish, pasted up in the streets of Breda, met his eye. Not being acquainted with the language, he asked a man who stood near him to translate the problem to him. This man happened to be Professor Beekman, principal of the University of Dort, and himself a mathematician. He smiled at the question of the young officer, and was greatly surprised the next morning to find that he had solved it. From hence Descartes went to Germany, and entered the Bavarian service. His situation, however, affording him little opportunity for pursuing his favourite studies, he left the army in 1621, and visited Moravia, Silesia, Poland, Pomerania, and the shores of the Baltic. In order to see West Friesland with advantage, he purchased a boat and embarked with a single valet. The sailors, thinking him a foreign merchant with much money in his baggage, resolved to kill him. Imagining him ignorant of their language, they conversed of their plan openly. Descartes, seeing his danger, drew his sword, addressed them in their own tongue, and threatened to stab the first man that should offer him violence. The sailors were overawed, and gave up their design. After a variety of travels he remained in Holland, where he composed most of his writings from 1629 to 1649, drew about him many scholars, and was engaged in many learned controversies, especially with theologians.

His celebrated system abounds in singularities and originalities; but a spirit of independent thought prevails throughout it, and has contributed to excite the same spirit in others. It has done much to give to philosophical inquiries a new direction, and found many adherents, especially in England, France, and Germany. Descartes seeing the errors and inconsistencies in which other philosophers had involved themselves, determined to build up a system anew for himself, divesting himself first of all the beliefs he had acquired by education or otherwise, and resolving to accept as true only what could stand the test of reason. Proceeding in this way he found that there was one thing that he could not doubt or divest himself of the belief of, and that was the existence of himself as a thinking being, and this ultimate certainty he expressed in the celebrated phrase '*Cogito, ergo sum*' (I think, therefore I am). Here, then, he believed he had found the test of truth. Whatever he saw to be true with as much certainty as he felt the certainty of his own existence was to be accepted as worthy of belief, and whatever could not stand that test was to be rejected.

Starting then from the indubitable reality of a thinking being, Descartes further says that this thinking being, that is to say, the soul, evidently differs from the body, whose existence consists in space or extension, by its simplicity and immateriality (whence, also, its immortality), and by the freedom that pertains to it. But every perception of the soul is not clear and distinct; it is in a great degree involved in doubt, and is so far an imperfect, finite being. This imperfection of its own leads it to the idea of an absolutely perfect being. (He therefore here makes use of the so-called *ontological* proof of the existence of God in a different manner from that in which Anselm of Canterbury had formerly employed the same; and hence the name of the 'Cartesian proof.') He placed at the head of his system the idea of an absolutely perfect being, which he considers as an innate idea, and deduces from it all further knowledge of truth. The principal problems of metaphysics he conceived to be substantiality and causality. He contributed greatly to the advancement of mathematics and physics. He made use of the discoveries and observations of others, defining them accurately, and assigning them their place in his system. The higher departments of geometry (to which he successfully applied analysis), as well as optics, dioptrics, and mechanics, were greatly extended by him, their method simplified, and thereby the way prepared for the great discoveries made in the sciences by Newton and Leibnitz; for instance, he contributed much to define and illustrate the true law of refraction. His system of the universe attracted great attention in his time, but has been long since exploded. It rests on the strange hypothesis of the heavenly vortices, immense currents of ethereal matter, with which space is filled, and by which he accounted for the motion of the planets. He laboured much to extend the Copernican system of astronomy.

Descartes loved independence; he nevertheless suffered himself to be persuaded to go to Stockholm, upon the invitation of Queen Christina, who was very desirous of his society. He died at that place four months after his arrival. His body was carried to Paris in 1666, and interred anew in the church of St. Étienne du Mont. Descartes was never married, but had one natural daughter, Francina, who died in his arms, in her fifth year, and whose loss he felt acutely. His works have at various times been published, singly and together; as, for instance, at Amsterdam, 1692–1701, nine vols. 4to. An edition of his works by Victor Cousin was published in eleven volumes at Paris and Strasburg in 1824–26. The most celebrated is his Discours de la Méthode, first published in 1637, and frequently republished. Bayle, Baillet, and Tepelius have written his life. See his letters; also the eulogies on him by Gaillard, Thomas, and Mercier, and Leibnitz's account of him in his letters.

DESCENDANTS. See DESCENT.

DESCENT, in law, is the transmission of the right and title to lands to the heir, on the decease of the proprietor, by the mere operation of law. A title by descent is distinguished from a title by purchase, which latter includes title by devise as well as by grant. The law of descent is, accordingly, the law relating to and regulating the inheritance of estates. Wherever there is an exclusive property in lands possessed by individuals, or, in other words, wherever the soil is held by distinct permanent proprietaries, the law provides for the disposition of the possession in case of the death of the proprietor, without any designation of heirs by himself. It is a theory of all states that the title to lands is originally in the government. The government considers itself to be the heir to all its subjects or citizens who leave no other heir. In some countries, as in Egypt particularly, the government is the perpetual and practical owner of the soil, and stands in the relation of landlord to all the cultivators, who are its tenants, and pay regular rents. It is a theory of the tenures of lands in England, that they are generally held, directly or indirectly, of the king, as superior lord. This is only the theoretical remnant of the principle, that the property in the soil belongs originally to the sovereign; and the title is held by the subject in England upon certain conditions; for the

lands of a traitor are forfeited, which makes allegiance one of the conditions of the tenure.

Though there are countries in which the sovereign is the sole landed proprietor, while in others he is the heir of the landed proprietors, whose estates are accordingly for life, yet most countries provide for the transmission or descent of property in lands to the heirs of the proprietor; one distinction in the different laws being, that some codes, or the provisions relating to some particular kinds of estate, do not permit the occupant or proprietor, for the time being, to alter the disposition made by the law. Thus, before the Conquest, lands were devisable in England, and the proprietor could appoint by will who should inherit them after his death; but it was one part of the policy of the feudal law, which was introduced into England after the Conquest, to take away this power, and make lands descend only according to a prescribed rule. But expedients have been resorted to in England to break entails, and give the present proprietor the power of disposing of the lands during his lifetime. These expedients are denominated a *fine* and a *common recovery*. In the case of entailed estates, the successive possessors do not in fact come in as inheritors to the preceding occupiers, but in virtue of the grant or original constitution of the estate; and these grants make the law for these particular species of estates. In Great Britain and on the continent of Europe a very large part of the soil is held by this species of title.

The rule determining to whom an estate belongs, on the decease of the proprietor, is that of consanguinity, or relationship by blood, though with some exceptions, as in the case of the portion or the use of a portion of a man's property, given, by the laws of Britain, to his widow. The rules of descent, designating what relations shall inherit, and their respective shares, will be determined by the genius and policy of the government and institutions. Hence the practice of entailments in the feudal system. And wherever the government is founded in family privileges, or very intimately connected with them, as is the case in all governments where the hereditarily aristocratical part of the community have a great preponderance, the sustaining of families will very probably be a characteristic feature in the code of laws. Thus, in Britain, all the lands of the father, unless otherwise directed by will, go to the eldest son; and accordingly all the eldest sons, who receive any benefit from this law of descent, are naturally the supporters of aristocratical privileges. Some remnant of this family policy, which prevails so generally in Europe, appears in the early laws of the American colonies and provinces, in the preference given to eldest sons, by assigning them a double portion of the inheritance. This distinction probably resulted very much from the mere force of habit and custom. It is, however, not improbable that a reverence for the Levitical code might have led some of the colonies to this distinction in favour of the first-born. This is an argument made use of in the pragmatic sanction, published by the Spanish king, March 29, 1830, annulling the rule of the Salic law, which excludes females from the succession. In this decree an argument is cited from the petition of the cortes of 1789, in favour of the right of the eldest, which is vindicated, 1, from the order of nature; 2, from the Old Testament; 3, from usage; from all which the petition infers, that 'the advantage of being the first-born is a particular mark of the love of God.' But the distinction in favour of the eldest son, which existed in the colonies now constituting the United States of America, has been abolished since the establishment of independence. A compendious notice of the various laws of the several United States on the subject of the descent of real estate will be found in the first volume of the American Jurist and Law Magazine. These laws are founded upon the principle of equal distribution, both of real and personal estates, among heirs of the nearest surviving degree, and the representatives of deceased heirs of the same degree; the representatives of a deceased heir who, when alive, was of the same degree with the nearest that survive, being entitled collectively to the share which would have come to such deceased heir had he been living. This general principle is adopted from the English statutes 22 and 23 Charles II., relating to the distribution of personal property; for the English law makes a great distinction as to the descent of real and personal estate, whereas, in the United States, they descend and are distributed upon the same general principle, though there are some differences in the particular provisions. But this right of taking by representation is very variously modified in the different states. This mode of succession is also the one observed in France since the abolition of the right of primogeniture by the Constituent Assembly in 1790.

To make the subject better understood, a word ought to be said on the subject of affinity, or degrees of consanguinity, which is very lucidly treated in Blackstone's Commentaries. Kindred in blood are divided into three general classes, viz. 1, descendants; 2, ancestors; 3, collateral relatives, that is, those who have descended from the same common ancestor. The civil law computes the degrees by counting the generations up to the common ancestor, as father, grandfather, great-grandfather; or mother, grandmother, great-grandmother; and from him or her down to the collateral relative, as brother, cousin, &c., making the degree of relationship the sum of these two series of generations. Every person has two sets of ancestors, the paternal and maternal, and therefore two sets of collateral relatives. There is also a distinction of collateral kindred, into those of the whole blood, and those of the half blood. Our limits will not allow us to state the various regulations in England as to the rules of inheritance among kindred of these different kinds; they are thus generally noticed merely for the purpose of intimating some general diversities in the rules of descent. Thus in England and France it is a rule that real estate cannot ascend, that is, cannot go to father, grandfather, &c., on the decease of the son, grandson, &c., for which the quaint reason is given by Bracton, that the *weight* of the inheritance makes it *descend*. Notwithstanding this supposed downward tendency of an inheritance in land, it is, in defect of descendants, made by the American laws to ascend, as well as to pass off collaterally; and this is the rule respecting personal estate both in England and the United States. Another distinction is made by the English laws, between collateral relatives of the whole and half blood, as the latter cannot inherit real estate; but in respect to personal estate in England, and both personal and real estate in the United States, no distinction of this sort is made. Another diversity in the laws of inheritance relates to the distinction of male and female heirs. The Jewish law preferred the male heirs. But the laws of England respecting personal estate make no distinction on account of the sex of the heirs.

DESCROIZILLES, François Antoine Henri, was born at Dieppe, June 11, 1751, where his father was an apothecary. He studied chemistry at Paris under Rouelle, and thereafter became professor at Rouen. He especially devoted himself to the technical applications of the science. Berthollet had hardly discovered bleaching by chlorine, when Descroizilles tried it at his work at Lescure-lez-Rouen, and found

that it succeeded. He first used chlorine water, but he afterwards collected the chlorine in water containing chalk, and thus made a step at a very early period in the direction of bleaching-powder. In the course of his operations he contrived different pieces of apparatus for the rapid valuation of commercial products. Thus his alkalimeter for the estimation of alkalies by Vauquelin's method, his apparatus for estimating vinegar (acetimeter), and for bleaching liquid (Berthollimeter) are among the earliest contributions to volumetric analysis. He also contrived a still for the estimation of alcohol in wine. He published a great many researches, especially on technical chemistry. He was the first to show that alum is a double salt. During the latter part of his life he resided at Paris, where he had been for long member and secretary of the General Council of Manufactures. He died at Paris, April 14, 1825.

DESEADA, Desirade, or Desiderada, one of the Leeward Islands, belonging to the French, in the Caribbean Sea, to the east of Guadeloupe. It is about 10 miles long, and hardly 5 broad. It was discovered by Columbus on his second voyage. The soil is in some places black and good; in others sandy and unproductive. Pop. 1788.

DESERET. See Utah.

DESERT, a term more particularly applied to vast barren plains such as are found in Asia and Africa, but which may also be used to designate any solitude or uninhabited place whether barren or not. See Sahara and Gobi.

DESERTER, a soldier or sailor who quits the service without leave. According to the military code of Great Britain deserters are tried by court-martial, which may inflict death as the extreme punishment, or a less severe punishment according to the circumstances of the case. Any soldier who is absent from duty without leave for twenty-one days must be tried as a deserter. In all armies desertion in time of war is of course regarded as a more serious offence than desertion in time of peace. See Branding.

DESERTION OF SPOUSE. By Act 20 and 21 Vict. cap. lxxxv., any husband who has been deserted by his wife, or wife who has been deserted by her husband for two years, without a cause, may obtain a judicial separation. The twenty-first clause of the act empowers a wife deserted by her husband to apply to a police magistrate, to the justices in petty session, or to the court for divorce and matrimonial causes, established by the act, for an order to protect any money or property she may have acquired since her desertion, against her husband, his creditors, or any person claiming under him. A decree of separation obtained during the absence of the husband may be reversed, on cause being shown for such reversal; but a reversal thus obtained does not prejudice the rights of other persons to have debts paid, contracts performed, &c., which had been contracted or entered into by the wife during the period of her separation.

By the Scotch law, where either the husband or wife has deserted and remained separate without due cause for four years, a judicial separation may be obtained by statute 1573, cap. lv.

DESFONTAINES, Pierre François Guyot, Abbé, born at Rouen in 1685; died at Paris in 1745, was one of those French literati who are known to us more for their controversies with Voltaire, and his biting attacks, than from their own productions. Voltaire, by the superiority of his wit, succeeded in gaining many to his opinions; but impartial judges have long agreed that he was not altogether correct, and that the criticisms of the Abbé Desfontaines, though severe, are by no means unjust. One of the works of the abbé, which had the misfortune to excite the particular displeasure of the poet, was the well-known Dictionnaire Néologique, of which the sixth edition appeared in 1750 (Amsterdam and Leipzig), and which was intended to guard the purity of the French language, as the great writers of the seventeenth century had formed it; and in this respect it has certainly proved of much service.

DESFUL, or Dizful, a town in Persia, in the province of Khuzistan, 30 miles north-west of Shuster, with about 15,000 inhabitants. It stands on the left bank of a river of same name, here crossed by a very ancient and magnificent bridge of twenty arches, and has numerous ancient remains, supposed to be of Sassanian origin. It is the principal market of the province, and has a considerable trade in indigo.

DESHOULIÈRES, Antoinette, a French lady of much literary reputation. Her maiden name was *Du Ligier de Lagarde*. The exact date of her birth is unknown, but she appears to have been born at Paris between 1633 and 1638. With a prepossessing appearance she combined a distinguished talent for light and agreeable poetry, which she cultivated under the direction of the poet Hainault. She was acquainted with the Latin, Spanish, and Italian languages, and studied philosophy in her later years, during which she suffered from continual sickness. Voltaire was of opinion that of all the French poets of her sex she had the greatest merit. Several learned societies elected her a member, and her agreeable manner, her animation and wit, which sometimes, but rarely, gave way to a gentle melancholy, made her the centre of attraction in the best societies at that period. The best edition of her works, containing also those of her daughter, Antoinette Thérèse (born 1662; died 1718), is that of Crapelet (Paris, two vols. 1799).

DESIDERIUS. See Didier.

DESIGN, in painting, the first plan of a large work, drawn roughly, and on a small scale, with the intention of being executed and finished in large. See Drawing.

In music, *design* means the invention and execution of the subject in all its parts, agreeably to the general order of the whole.

In manufactures, *design* expresses the figures with which the workman enriches his stuff or silk, and which he copies after his own drawing, or the sketches of some artist.

DESIGN, Government Schools of. See Science and Art (Department of).

DESIGNS, Copyright in. The first act of Parliament relating to this is 27 George III. cap. xxxviii., passed in 1787. The act which now regulates the law of copyright as to designs is 5 and 6 Vict. cap. c. (August 10, 1842), as amended by 21 and 22 Vict. cap. lxx. (August 2, 1858). By the former act all articles of manufacture and substances on which designs are executed are divided into thirteen classes, for some of which (articles manufactured in any metal or mixed metals, in wood, in glass or in earthenware; paper-hangings; carpets; shawls on which the design is not produced by printing, or any other process of producing colours on tissues; and woven fabrics coming within the description technically called furnitures, in which the design is applied by printing, or any other way of producing colours on tissues) the copyright of the design was fixed at three years; for others (shawls, yarn, thread, or warp, and woven fabrics, except such as are technically called furnitures, in which the design is applied by printing, or in any other way in which colours may be produced upon the materials) the copyright was fixed at nine months; and for the others (woven fabrics not comprised in any preceding class, and lace and any article of manufacture or substance not comprised in any preceding class) the copyright was fixed at twelve months. The act of 1858 amends this act by

extending the copyright of designs for woven fabrics mentioned in the tenth class, that is, such as come within the description technically called furnitures, and have the design applied to them by printing or any other mode of producing colours on tissues, to three years as the extreme limit, the term of copyright being computed from the date of registration, but not to extend beyond the 31st of December of the second year after the date of registration. This act also enables a designer to register a pattern of a new design, instead of a copy or specification in writing.

DESMAN. See MUSK RAT.

DESMOLOGY (from the Greek *desmos*, a ligament, and *logos*), that branch of anatomy which treats of the ligaments and sinews.

DESMOULINS, BENOÎT CAMILLE, born in 1760 or 1762, was conspicuous during the first period of the French revolution. His exterior was mean; he was of a dark complexion, and repulsive expression. From the commencement of the revolution he was connected with Robespierre, with whom he had studied at college. From the secret meetings which he had at Mousseaux with the Duke of Orleans, it may be inferred that he was at first only the agent of this prince. He chose the Palais Royal for the usual scene of his citizen-apostleship, and was constantly seen there surrounded by many orators, who, with him, prepared the plan for the taking of the Bastille (July, 1789). After this first triumph he endeavoured to excite the minds of the people by his orations or his publications, and called himself *procureur-général de la lanterne*. He then became one of the founders of the club of the Cordeliers, connected himself intimately with Danton, and remained faithful to him. On the flight of Louis XVI. to Varennes he was one of the instigators of the assembly of the Champ de Mars. He was particularly active in the tumult of June 20, 1792, and on the 10th of August in the same year. About this time he was secretary to the minister of justice, Danton, and prepared with him the scenes of September. As deputy of Paris in the national convention he defended the Duke of Orleans, December 16. January 16, 1793, he gave his vote for the death of Louis XVI. His friendship for Danton was the cause of his fall. Robespierre, at the head of the committee of public safety, was making rapid progress towards tyranny. Danton, assisted by the leaders of the Cordeliers, intended to resist this committee, and Camille commenced the attack in his journal Le Vieux Cordelier, in which he declared himself against the terrorists, and even made use of the word *clemency* (*clemence*). Along with Danton he was arrested on the order of Robespierre on the 30th of March, 1794. On the 2d of April he was tried and condemned, and on the 5th was executed. His wife, whom he adored, and who returned his affection—a beautiful, courageous, and spirited woman—desired to share her husband's fate. Robespierre ordered her to the scaffold eight days after Desmoulin's death. During her trial she evinced a wonderful tranquillity, and died with much greater firmness than her husband.

DESNA, a river in Russia, which rises in the government of, and about 50 miles east of the town of Smolensk, flows south-east through that government and the government of Orel, till it reaches Briansk, where it suddenly turns S.S.W., and continues that direction into the government of Tchernigov, which it traverses circuitously, first south-west and then west to Tchernigov. It now resumes its S.S.W. course, and on reaching the frontiers of the government of Kiev, joins the left bank of the Dnieper nearly opposite the town of Kiev. It is navigable nearly throughout its whole course, which exceeds 500 miles.

DESPOT (from the Greek *despotēs*), originally a *master*, a *lord;* at a later period it became an honorary title which the Greek emperors gave to their sons and sons-in-law when governors of provinces. Alexis III., surnamed *Angelus*, towards the end of the twelfth century, is said to have first introduced this title, and to have made it the first in rank after that of emperor. Thus there was a despot of the Morea, of Servia, &c. At present, *despot* means an absolute ruler, as the Emperor of Russia; but, in a narrower sense, it conveys the idea of tyranny, as in fact the possession of absolute power and the abuse of it are two things bordering very closely on each other.

DESSALINES, JEAN JACQUES, Emperor of Hayti, born in Africa about 1760, was a slave in 1791, when the insurrection of the blacks occurred in that island, but was set free along with the other slaves in St. Domingo in 1794. His master was a shingler of houses, and Jean Jacques was bred to the same trade. His talents for war, his enterprise, courage, and unscrupulous conduct raised him to command in the many risings that took place among the coloured population of the island about that time; and when Le Clerc invaded the island in 1802 Dessalines and Christophe stood next in reputation and rank to Toussaint-L'Ouverture. (See TOUSSAINT.) After the deportation of the latter, Dessalines, Christophe, and Clervaux took the command, and maintained a desperate and sanguinary warfare against the French, until the latter evacuated the island. This happened in Nov. 1803. The black chiefs immediately proceeded to proclaim the island independent, restoring its Indian name of *Hayti*, and nominated Dessalines governor-general for life, with absolute power. Dessalines now gave full scope to his savage character. He began by ordering a general massacre of the French, without distinction of age or sex, stimulating the negroes to glut their vengeance for the wrongs they had undergone. In the autumn of 1804 he was declared emperor, with title of Jacques I.; and in May ensuing he promulgated a new constitution, containing provision for permanently organizing the imperial government. His reign, however, was brief; for the people, aided by the troops, sick of his atrocities, and wearied out by his suspicious and vindictive conduct, conspired against his life, and he was killed by one of his soldiers, October 17, 1806, who thus ended a despotism stained by every barbarous enormity.

DESSAU, a town in Germany, capital of the duchy of Anhalt, in a beautiful valley on the left bank of the Mulde, on the railway between Berlin, Köthen, and Leipzig. The principal building is the ducal palace close on the Mulde, built in 1748, not possessed of great architectural merit, but surrounded with fine gardens, and containing both a picture-gallery and a library, in which are numerous MSS. of Luther. The manufactures consist of woollen and linen cloth, hats, leather, tobacco, musical and other instruments; and there is an extensive worsted as well as several other mills, and an important corn-market. The ground around Dessau, originally a sandy waste, has been completely reclaimed, and is now covered with beautiful gardens, forming the chief attraction of the place. Moses Mendelssohn, grandfather of the celebrated musician, Felix Mendelssohn Bartholdy, and author of Phædon, was born here in 1729. Pop. in 1871, 17,464.

DESTERRO, a town in Brazil, capital of the province of Santa-Catharina, near the centre of the west coast of the island that gives that province its name. It stands on a tongue of land which projects west into the bay, and is defended by two forts. Its situation is unhealthy, and it is very poorly built—the streets being very irregular and badly paved.

The harbour, formed between the island and the mainland, is, next to that of Rio de Janeiro, the best on the Brazilian coast, having all the requisites of sufficient depth, capacity, and shelter. The trade is as yet very limited; the exports, consisting chiefly of planks and timber for building, are all sent to Monte Video and Buenos Ayres. In 1838 a dreadful thunder-storm destroyed part of the town, and committed great ravages both on the island and the mainland. Pop. about 8000.

DESTOUCHES, Philippe Néricault, one of the best French comic poets, was born at Tours in 1680. At the age of nineteen he entered the army, and having written the comedy called Le Curieux Impertinent while in winter quarters at Huningue, near Basel, and read it in several societies, M. Puysieux, then ambassador in Switzerland, was struck with it, and persuaded the author to turn his talents to diplomacy. In Switzerland he wrote several plays, which met with great applause. By his knowledge of diplomacy he likewise gained the favour of the regent, who sent him to England in 1717, as an assistant to the Abbé Dubois. When Dubois returned to France Destouches remained in England, where he married. He acquitted himself so well in the business intrusted to him, that the regent promised to give him a proof of his satisfaction which would surprise all France; but upon the death of this prince he lost his protector and his expectations. He retired to his country seat at Fort-Oiseau, near Melun, and endeavoured to forget the caprice of fortune in the study of philosophy and devotion to the muses. Cardinal Fleury wished to send him to St. Petersburg as ambassador, but he declined the offer. He died in 1754, leaving a son, who, by order of Louis XV., superintended the publication of his works. After Molière and Regnard Destouches is considered the best French writer in the department of comedy. His comedies Le Glorieux and Le Philosophe Marié are considered among the best French works of their class. But as he made the comic effect subordinate to the moral, his productions have something of the character of sentimental comedy (la comédie larmoyante). He excels most in the drawing of character, and exhibits a fertile imagination, pleasing wit, elegance, vivacity, and decorum. His numerous epigrams are poor. An elegant edition of his works appeared in 1757, in four vols. 4to; and again in 1822.

DESTUTT DE TRACY, Antoine Louis Claude, a philosophical writer, born July 20, 1754, of a family of Scottish extraction; died in 1836. At the time of the French revolution he was a colonel of infantry. In 1789 he was one of the deputies to the Constituent Assembly, and as such showed himself a friend to liberal ideas, and voted for the abolition of the privileges of the nobility. When his friend Lafayette left France on the 10th August, 1792, Destutt de Tracy accompanied him, but after some time he secretly returned and was arrested on the 2d of November, 1793. After the fall of Robespierre he recovered his freedom. During the time of Napoleon's rule he was a senator, although he cannot be reckoned among the number of Napoleon's flatterers. On the return of the Bourbons he was made a peer; during the period of the Hundred Days he did not take any office. He was one of the members of the National Institute from its foundation in 1795, and in 1808 he was admitted as a member of the French Academy. Destutt de Tracy was a philosopher of the sensualist school, and reduced all our knowledge to sensation. He is remarkable for the lucidity and philosophical precision which he shows in the treatment of several abstruse metaphysical problems. The chief works of Destutt de Tracy are, Idéologie (1801); Grammaire générale (1803); and Logique (1805); Essai sur le Génie et les Ouvrages de Montesquieu (1808); Traité de la Volonté (1815); and Commentaire sur l'Esprit des Lois. The last-mentioned work was written in 1806, and sent by Destutt de Tracy to his friend Jefferson, president of the United States, who translated it into English, and had it published at Philadelphia in 1811. The original French was published at Paris in 1817, and again in 1819, 1822, and 1828.

DESULTORES (from *desilio*, I vault), the Latin name for vaulters or leapers, who jumped from one horse to another. The Scythian, Indian, and Numidian cavalry were very expert desultores, and each man carried at least two horses to the field. When one was weary he jumped with great agility upon another, which he led by his hand. The Greeks and Romans introduced the same practice in their games, races, and funeral solemnities, but never, as far as we know, in war. Homer describes a vaulter of this sort, who performed his feats on four horses at once (Iliad, xv. 679); and Livy (xxiii. 29) describes a kind of Numidian cavalry in Hasdrubal's army in Spain, in which the soldiers had two horses each, and in the heat of an engagement frequently leaped, fully armed, from one to another. Ælian gives a similar account of a tribe dwelling not far from the Danube, who, on this account, were called *Amphippi*.

DETACHMENT, a body of troops selected from the main army for some special service.

DETMOLD, a town, Germany, capital of Lippe-Detmold, on the left bank of the Werra, 50 miles south-west of Hanover; pop. in 1871, 6469. It consists of an old and a new town, the former poorly, the latter regularly built. Its principal edifice is the palace, a fine old castellated building, with a vast round donjon tower. In the vicinity, on the Grotenberg, the loftiest summit of the Teutoburger Wald, a colossal statue, 45 feet high, placed on a solid circular pedestal twice that height, has been erected to the Hermann or Arminius who overthrew Varus and his legions.

DETONATION, a sudden combustion and explosion.

DETRITUS, in geology, small fragments of matter worn off or detached from solid bodies by attrition, distinguished from debris, which is made up of larger fragments.

DETROIT, a flourishing lake-port town, United States, the largest town in Michigan, of which it was formerly the capital, situated on the Detroit or Strait River, connecting Lakes Erie and St. Clair. Few places, even in the States, have grown so rapidly into importance as this, which is due to its admirable position for trade, and to its connections with a region into which a constant tide of emigration is flowing. The means of communication by both water and rail being very ample, trade and manufactures have been largely developed, Detroit being the central entrepôt for the produce and general traffic of the whole state, and nearly all the merchants in the upper lake region, as well as in the interior, making most of their purchases here. Among the industrial establishments are nine large steam saw-mills, which annually prepare about 40,000,000 feet of pine lumber for export; five flour-mills, large building-yards for ships and boats, and numerous foundries, tanneries, and breweries. Extensive establishments also manufacture locomotive and other engines, machinery, agricultural implements, &c. Considerable trade is carried on with the Canadians, and the aggregate value of exports and imports now amounts to several millions of dollars annually. The harbour is one of the finest in the United States, and has a depth of water sufficient for the largest vessels. Though settled by the French from Canada in 1683, and long maintained

as a considerable military post, to command Lake Erie, &c., yet the resident population was, in 1830, but 2222; in 1853 it was 34,436; and in 1870, 79,577.

DETROIT RIVER, or STRAIT OF ST. CLAIR, a river or strait of North America, which runs from Lake St. Clair to Lake Erie. *Detroit* is the French word for *straits;* and the name was given by the French, the first white men who settled here. Its course is nearly south, with a gentle current, and sufficient depth of water for the navigation of large vessels; the banks are covered with settlements, and the country is exceedingly fertile. Near the banks of the river are many fine orchards of apple-trees, pear-trees, and cherry-trees, producing as fine fruit as any in the United States, and presenting a very agreeable view as one sails up the river. It is 28 miles long, and ¾ mile wide opposite to Detroit, enlarging as it descends.

DETTINGEN, the name of several places in Germany. The only one particularly deserving of notice is a village of Bavaria, on the right bank of the Main, 9 miles north-west of Aschaffenburg, famous for the victory gained by the English and Austrians under George II. of England over the French in 1743 under Marshal Noailles.

DEUCALION, in Greek mythology, father of Hellen, ancestor of the Hellenes, was the son of Prometheus and Clymene. He was king in Phthia. The following is the myth with which his name is connected. Zeus, it is said, determining to destroy mankind by water, on account of their impiety, brought a flood upon the earth, by means of a violent rain; Deucalion saved himself and his wife Pyrrha on the top of Mount Parnassus. After the flood had subsided they consulted the oracle of Themis, to know what they must do to repair the loss of mankind; and were directed to throw behind them the bones of their mother. Understanding their mother to signify the earth, and her bones the stones, they did as the oracle directed. The stones thrown by Deucalion became men and those thrown by Pyrrha became women. Many other circumstances are related by the ancient writers concerning this deluge which bear a resemblance to those related in the Scriptures of the deluge of Noah. See DELUGE.

DEUCE, or DUSE, an evil spirit. This word is only used as an exclamation, as, 'What the deuce is the matter?' It is generally derived from *dusius*, a Latinized term supposed to be formed from the Armorican *teuz*, a phantom or spectre. St. Augustine (De Civitate Dei, 15, 23) has the words 'Quosdam dæmones quos dusios Galli nuncupant.' Isidorus, in his glossary annexed to Martinius, suggests that *dusius* may be a corruption of the name of *Drusus*, son of Tiberius, notorious for his German victories, whose name may have been perpetuated as a term of terror among the conquered people. Another derivation also might be suggested. *Teut* or *Deut* was the name of a deity among the ancient Germans. May not the Saxons have continued to swear by this name, even after their baptism, and have carried it with them to England? Their continuing to use the word would not be more surprising than the practice of the Italians, who still retain the exclamations *per Bacco* (by Bacchus!), *per Venere* (by Venus!), &c.

DEUS EX MACHINÂ, a phrase used to designate the resorting to supernatural causes to explain phenomena that one is not able to account for by natural means. The phrase is taken from the practice in the ancient stage of introducing a god from above by means of some mechanical contrivance whenever it was necessary to cut some dramatic knot which could not be loosed by the human actors.

DEUTERONOMY, the last of the books of Moses. The word is derived from the Greek *deuteros*, second, and *nomos*, the rule or law, because the book of Deuteronomy is a repetition which the legislator made to the Israelites just before his death of the law which he had before delivered to them at large.

DEUTZ, a town in Prussia, in the province of the Rhine, on the right bank of the river Rhine, opposite the city of Cologne, with which it communicates by a bridge of boats 1400 feet long. It is strongly fortified, as part of the defences of Cologne—forming, in fact, a *tête-du-pont*. The harbour is good, and contains numerous shipping, particularly in winter. Deutz is a very ancient place, and is said to owe its origin to a castle built on its site by Constantine the Great. The finest view of Cologne, with its ranges of buildings stretching 3 miles along the river, is obtained from the extremity of the bridge on this side. Pop. in 1870, 11,881.

DEUTZIA, a genus of plants belonging to the natural order Philadelphaceæ established by Thunberg, and containing seven or eight species, all of which are interesting by the beauty of their flowers. Some of the species are cultivated in Europe. They are small shrubs indigenous to China and Japan, and Northern India. They are covered with stiff, stellate hairs, on which account one species (*Deutzia scabra*) is used by joiners in Japan to polish wood. The flowers are arranged in thyrsi.

DEUX-PONTS, the French name for the German city *Zweibrücken*, in Latin *Bipontium*, all which names signify *Two-Bridges*. There was formerly a county of this name, which took its name from a town so called in the Palatinate. It was afterwards erected into a duchy. By the Peace of Luneville the duchy was ceded, with all the left bank of the Rhine, to France, and afterwards composed a part of the department of the Donnersberg. It contained 70,000 inhabitants, on 763 square miles. By the peace of May 30, 1814, it was restored to Germany. See ZWEIBRÜCKEN.

DEVA, the Latinized form of a Celtic word signifying water, a frequent name of rivers in England and Scotland, and preserved in the modern Dee, Tay, &c. Also a Sanskrit word meaning God, occurring in various geographical compounds.

DEVELOPMENT THEORY. See EVOLUTION, EMBRYOLOGY, and TERATOLOGY.

DEVENTER, a town in Holland, in the province of Overijssel, 8 miles north from Zutphen, at the confluence of the Schipbeek and Ijssel. It is strongly fortified, and the streets are for the most part narrow, but the market-places are large and commodious. There are a large town-hall, a courthouse and prison, two Reformed churches, besides places of worship for the Lutherans, Mennonites, Roman Catholics, and Jews. Deventer was formerly the third commercial city in Holland, and has still a large export trade. It exports annually 600,000 lbs. of butter and 365,000 Deventer cakes (made with honey). It has a royal Turkey carpet manufactory, an iron-foundry, a stocking manufactory, and various other industrial establishments. Pop. at the end of 1868, 18,218.

DEVEREUX, ROBERT. See ESSEX (ROBERT DEVEREUX, EARL OF).

DEVERON, or DOVERAN, a river of Aberdeenshire, rising in the parish of Cabrach, which, after running a course of 40 miles, and forming the boundary between this county and the shire of Banff, falls into the sea at Banff. The salmon-fishery in this stream is very valuable. Deveron means Blackwater, the name by which this river is known among the Gaelic speaking population, while the English speaking population use the Gaelic name of Deveron.

DEVIATION, in the law of marine insurance, an unnecessary departure from the usual course of the voyage insured. The necessary causes of departure

from the customary line are stress of weather, urgent want of repairs, joining convoy, succouring ships in distress, danger from an enemy, sickness, and mutiny. Even in these cases the shortest and easiest courses must be taken, or a deviation will be incurred. Deviation, from the moment at which it commences, discharges the insurer from all subsequent responsibility, and entitles him to retain the premium.

DEVICE, or BADGE, in heraldry, a name common to all figures, ciphers, characters, rebuses, mottoes, &c., which, by their allusions to the names of persons, of families, &c., denote their qualities, nobility, or the like. Device, in this sense, is of a much older standing than heraldry itself, being that which first gave rise to armorial ensigns. Thus the eagle was the device of the Roman Empire. S.P.Q.R. was the device of the Roman people, and still continues to be what is called the escutcheon of the city of Rome. The first devices were mere letters placed on the borders of liveries, housings, and banners, and at length on shields. Thus K (the initial letter of Karolus) was the device of the French kings of the name of Charles from Charles V. to Charles IX. Badges, impresses, and devices were greatly in vogue in England from the reign of King Edward I. until that of Queen Elizabeth, when they sank into disuse.

Device is now taken, in a more limited sense, for an emblem or a representation of some natural body, with a motto or sentence applied in a figurative sense. Thus a young nobleman, of great courage and ambition, bore for his device, in a carousal at the court of France, a rocket mounted in the air, with this Italian motto, *Poco duri, purchè m'innalzi* (May I continue but a short time, provided I mount high). A device is, therefore, a painted figure of speech. Devices are used on coins, counters, seals, shields, triumphal arches, artificial fire-works, &c. The French have distinguished themselves in the invention of devices, especially since the time of Cardinal Mazarin, who had a great fondness for them. The Italians have reduced the making of devices to an art, and laid down laws and rules for this purpose.

DEVIL (Greek, *diabolos*, a slanderer). Most of the old religions of the East acknowledged a host of demons, who, like their gods, were not originally considered, in a moral point of view, as good or bad, but merely as exercising a salutary or injurious influence. In the latter case they were looked upon as punishing spirits, without inimical or wicked purpose. Siva, the judging and destroying god of the Indian mythology, is a symbol of the great power of nature, which is alternately beneficial and injurious, but in itself neither good nor evil. The doctrine of Zoroaster, who adopted an evil principle called *Ahriman*, opposed to the good principle, and served by several orders of inferior spirits (in order to explain the existence of evil in this world), spread the belief in such spirits among the people. The Greek mythology did not distinguish with the same precision between the good and bad spirits. The Titans, it is true, struggled against the gods, but not for any merely moral reason, and the gods are not represented as patterns of pure morality. The Furies, again, always appear more in the character of punishing than of malignant spirits. On the contrary, Hecate, the goddess of the lower world and of enchantment, and the Lamiæ, corresponding to the witches of the modern popular belief, have more of what we understand under the diabolical character. Beelzebub, or Beelzebel, appears from an accusation brought against our Saviour to have been regarded by the Jews as the prince of the devils. As the captivity of the Hebrews in Babylon had in many respects a decisive influence upon their way of thinking and prevailing notions, by the acquaintance which they there acquired with the ideas of the Chaldeans, it is not impossible that their notion of Beelzebub may have been derived from them, and accorded with that of Ahriman of Zoroaster. It is impossible, however, to adopt the hypotheses of German rationalists, who have laboured hard to show that the idea of the evil spirit so often referred to in Scripture was derived from no more authentic source.

According to the Mohammedans, who have derived their account from Jewish traditions, the devil, or, as they sometimes call him, *Eblis*, was an archangel, whom God employed to destroy the *jinns* or genii, a race intermediate between men and angels, who tenanted the earth before the creation of Adam. In riches, power, and magnificence, the pre-Adamite sultans of the jinns far surpassed the height to which monarchs of the human race have attained, but the pride with which such glories inspired them filled them with impiety, and their monstrous crimes at length provoked the wrath of the Omnipotent. Satan was then commissioned to destroy them; he exterminated the greater part of the perfidious race, and compelled the rest to seek refuge in the mighty Kaf, or mountain framework which supports the universe. This victory filled Satan with pride; and when God, after the creation of Adam, required all the celestial intelligences to worship the new being, Satan and his adherents peremptorily refused, upon which he was stoned out of heaven by the faithful angels. Hence the common Mohammedan saying, 'God preserve us from Satan, who was stoned!'

The Satan ('adversary') of the New Testament is a rebel against God. Endowed with the intellect and power of angels, he uses them since his fall to entangle men in sin, and obtain power over them. He is 'the prince of the world' (John xii. 31), the Antichrist, because he constantly opposes the great work of salvation. But though he succeeds in effecting the perdition of individuals, yet his own damnation, and the eternal victory of good over evil, are certain. Neither is he an independent, self-existent principle, as Zoroaster makes him, but a creature subject to omnipotent control.

The doctrine of Scripture on this subject soon became blended with numerous fictions of human imagination, with the various superstitions of different countries, and the mythology of the pagans. In Italy, Greece, and Germany this last element was, and to a certain degree still is, blended with the idea of the devil. The gods of the ancients became evil spirits, seeking every opportunity to injure mankind. The excited imaginations of hermits, in their lonely retreats, sunk as they were in ignorance and unable to account for natural appearances, frequently led them to suppose Satan visibly present; and innumerable stories were told of his appearance, and his attributes distinctly described. Among these were horns, a tail, a cloven foot, &c. The writings of the fathers of the church also contain several passages respecting the appearance of the devil. The sign of the cross was considered as a safeguard against him, and crucifixes were erected on many spots, as, for instance, cross-ways, where he was supposed to be most likely to present himself. In most works or appearances of an extraordinary character, the devil was supposed to be concerned. How many a dam, bridge, &c., has been built in one night with his assistance! and every one knows that the monks, applying the legends that had become connected with Dr. Faust, the reputed worker of magic, to Fust, to whom the invention of printing has frequently been ascribed, made the people believe that he invented the art by the help of Satan.

In consequence of the cures which Christ and his apostles performed on the possessed, the early church

believed in a power connected with the consecration of priests to drive out evil spirits; and as early as the third century, particular officers of the church were appointed for this purpose; they were called *exorcists*, and are to this day the second of the lower orders in the Latin Church. The Catholics say the church employed such inferior ministers for this business, in order to show the contempt which it entertained towards demons; but this does not agree with the numberless legends of the power of the devil. (See EXORCISM.) The belief in evil spirits, witches, &c., was, in the seventeenth century, so common that they became the objects of judicial process. (See WITCH.) It cannot be said that the Reformation directly overturned this belief. Luther once threw an ink-stand at the devil, who, he believed, interrupted him when he was engaged in translating the Bible; and even to this day the black spot is shown on the wall in his room in the Wartburg. The trials of witches in the seventeenth century took place in Protestant countries as well as in Catholic ones. With the progress of the natural sciences, however, in the eighteenth century, many wonderful phenomena became explained, and less was heard of witchcraft. Our limits will not allow us to give a statement of the opinions of different Christian sects respecting evil spirits.

DEVIL, TASMANIAN. See DASYURES.

DEVIL-FISH, the popular name of a large species of ray, which is occasionally captured on the coasts of America. During gales of wind or from strong currents these immense fish are driven into shoal water, and being unable to extricate themselves, fall an easy prey to the vigilance of the fishermen, who obtain considerable quantities of oil from their livers. The peculiar arrangement of the two lateral appendages to the head has induced naturalists to erect a subgenus expressly for the reception of these marine monsters, which has been called *Cephaloptera*, in allusion to the wings, or processes. In size the species of this subgenus exceed all others of the family, individuals frequently measuring 16 feet from the angles of the body. *Cephaloptera giorna*, the devil-fish, sea-devil, &c., is recognized by the following characters:—'Jaws terminal, inferior one advanced; mouth with a movable flabelliform appendage on each side; eyes prominent, lateral; tail longer than the body, and armed with one or two spines, very distinct from the dorsal fin, which is situated between the ventrals;' teeth very minute and numerous, arranged in rows. The skin of this fish is not covered with spinous protuberances like that of most others of the ray species, but is merely rough to the touch, like that of many sharks. Colour above, blackish; beneath, white, varied with dusky. The breadth of one specimen was between 15 and 16 feet, the length 7 feet 10 inches, exclusive of the tail, which was somewhat longer than the body. They have been observed on various parts of the American coast, generally in small families, and are believed to visit sandy bottoms for the purpose of breeding, arriving in July, and seldom remaining later than the end of September.

DEVIL'S ADVOCATE. See ADVOCATUS DIABOLI.

DEVIL'S BASIN, a harbour on the south side of Tierra del Fuego, in Christmas Sound, lat. 55° 16′ S.; lon. 70° W., so named by Captain Cook in 1774, on account of its gloomy appearance. It is surrounded by high and savage rocks, which deprive it of the rays of the sun.

DEVIL'S BRIDGE (*Teufelsbrücke*), a famous bridge in Switzerland, over the Reuss, built of stone from mountain to mountain, 75 feet in length, on the road over St. Gothard, from Germany to Italy. It owes its name principally to its antiquity, for there are higher, longer, and wider bridges in Switzerland. It is a very common subject of prints and paintings, and is situated in a most romantic country. It was partially destroyed by the French in the wars of the revolution, but was repaired by the Austrians. It was crossed by the Russians under Suvaroff, and afterwards entirely restored. In 1830 a fine new bridge was built, not far from the old one.

DEVIL'S DUST, a name sometimes applied to old woollen goods when torn up into their orginal fibres, to be woven again into new fabrics, called *shoddy*.

DEVIL'S PUNCH-BOWL, a lake of Ireland, near the summit of Mangerton Mountain, in the vicinity of the Lakes of Killarney. It is between 2000 and 3000 feet above the level of the sea, and is supposed to be the crater of an ancient volcano. It is about half a mile in length and fully one-third in breadth.

DEVIL'S WALL, in the south of Germany. It was very common for gigantic works of art, or peculiar formations of nature, to be attributed, in the middle ages, to the devil. This wall was originally a Roman ditch, with palisades behind it. It was intended to protect the Roman settlements on the left bank of the Danube, and on the right bank of the Rhine, against the inroads of the Teutonic and other tribes. The wall extended for about 368 miles, over mountains, through valleys, and over rivers, running towards the Danube. Remains of it are found at present only from Abensberg, in Bavaria, to Cologne, on the Rhine. Sometimes these remains form elevated roads and paths through woods, sometimes tall oaks grow upon them, sometimes buildings stand upon the imperishable structure. As to the time when this rampart was built our information is very scanty. Some parts of the northern Roman fortifications may be as old as the time of Drusus. The Decumat or Tithe Lands, however, that is, the lands to the east of the Rhine and north of the Danube, which the Roman emperors allowed immigrants to settle on, on condition of paying tithes to the state, do not appear to have had any protecting wall about 14 B.C. The main rampart, stretching southwards from the Main to the Danube, was probably completed under Hadrian, and parts of it which had been destroyed seem to have been restored by Probus. All the parts of this great rampart are still far from being thoroughly investigated, but a complete knowledge of all that can be ascertained in connection with this subject may be expected as the result of the united labours of the various historical societies that have devoted themselves of late years to this particular task.

DEVISE, in law, is the disposition of real estate by will. It is distinguished from a bequest of personal estate by will, the personal estate so disposed of being called a *legacy*. The word *devise* is also sometimes applied to any gift by will, whether of real or personal estate. The person to whom a devise is made is called *devisee;* the person who makes it is called the *devisor*.

DEVIZES, a parliamentary borough and market town in England, in the county of Wilts, finely situated on a commanding eminence, 82 miles west by south of London. The name is derived from the Latin *divisæ* (understand *terræ*, divided lands), because the ancient castle of Devizes was built at the meeting-place of three different manors, Potterne Manor, Canning's Manor, and the Bishop's Manor. Some of the houses have an antique appearance, being built of timber and plaster, but most of the others are handsome modern buildings. It has four parish churches, two of them very handsome, besides other places of worship; a town-hall, a handsome corn-exchange, assize

courts, house of correction, and county bridewell. In the spacious market-place is a handsome cross, erected in 1815. It has a government school of art, besides other schools. Three silk manufactories have been established, and there is a factory for silk-throwing about half a mile from the town. Weaving of crape and sarsanet is on the increase, but malting is carried on less extensively than formerly. A large snuff manufactory has been long established. The borough by the reform bill of 1867 returns one member to the House of Commons; it formerly sent two. The town is of very ancient origin, being noted for the large and strong ancient castle which Roger, bishop of Salisbury and Wells, built in the reign of Henry I., and which was taken from him by King Stephen, and dismantled in the reign of Edward III. Hardly any trace of it now remains. Pop. in 1871, 6839.

DEVON, a beautiful little river of Scotland, on the confines of Stirling and Clackmannan shires. It has its source at the foot of the Ochil Hills, and after a circuitous course of about 40 miles, through romantic scenery, it falls into the Forth about 2 miles above Alloa. A little above Dollar, at the Rumbling Bridge, it forms a series of cascades, the most noted of which is called the Caldron Linn. Burns has celebrated this river in his fine song, beginning—

'How pleasant the banks of the clear, winding Devon,
With green spreading bushes, and flowers blooming fair!'

DEVONIAN SYSTEM OF ROCKS. See GEOLOGY.

DEVONPORT, a maritime and fortified town and parliamentary borough of England, in the county of Devon, on the east and north sides of the estuary of the Tamar, which here forms the harbour of the Hamoaze. It is 218 miles W. by S. of London, and 1½ mile W. of Plymouth. It is of an oblong form; the houses are of stone, and generally well built. The footpaths are of marble obtained in the neighbourhood, and have a very beautiful appearance when washed by a shower. Water is obtained from Dartmoor. A bastioned wall and fosse defends the town on the north-east and south sides, while the sea entrance is protected by heavy batteries on Mount Wise, two of which are of recent erection. The principal public buildings, exclusive of the churches, are the guildhall, decorated with a noble Doric portico, mechanics' institute, temperance hall, royal British female orphan asylum, and the post-office. It is the chief naval arsenal of Britain, and comprises one of the finest dockyards in the world (72 acres in extent), with building slips, dry docks, machine works, foundries, ropewalks, &c. The Keyham steamyard and factory consists of a series of granite basins, covering in all 100 acres, and capable of receiving the largest armour-plated vessels of the navy. There are barracks for 2000 men, and batteries and other works for the defence of the harbour and docks erected at an immense cost. The Hamoaze is a commodious basin ½ mile broad and 5 miles long. It is a magnificent repository for ships of war of all classes, and is capable of accommodating the entire British navy at once. Devonport was originally called Plymouth Dock, and viewed as an appendage of the town of Plymouth. Its name was changed to Devonport in 1824, to commemorate which a fine fluted column was erected near the guildhall. Pop. of municipal borough (1871), 49,449; of parliamentary borough, 64,034.

DEVONSHIRE, the third largest county in England, being about 72 miles in length, and from 50 to 67 in breadth; area, 1,655,161 acres, or 2586 square miles. It is bounded on the N. and N.W. by the Bristol Channel; on the S. and S.E. by the English Channel; on the E. by the counties of Somerset and Dorset; and on the W. by the county of Cornwall, from which it is separated by the river Tamar.

The soil and aspect of this county are extremely diversified. It is watered by a number of rivers, some of which fall into the Bristol Channel, and some into the English Channel. Among the former are the Torridge and the Taw. The principal river which enters the English Channel is the Exe, which rises in Exmoor, and passing Exeter and Topsham becomes navigable to the sea. Westward of this is the Teign, which empties itself into the sea at Teignmouth; the Dart, which forms at its estuary the harbour of Dartmouth; and the Tamar, which forms a boundary between Devonshire and Cornwall. Other rivers are the Axe, the Otter, the Aven, the Erme, the Yealme, the Plym, and the Tavy.

From Exeter to the confines of Cornwall extends the wide and barren tract called Dartmoor. The vale of Exeter, comprising from 120,000 to 130,000 acres, presents a remarkable contrast to this sterile tract, being one of the most beautiful and fertile districts in England. The south extremity of the county, limited interiorly by a line drawn from Torbay to Plymouth Sound, called *South Hams*, comprising about 240 square miles, is also extremely fertile, being so rich and productive as to be distinguished by the name of the garden of Devonshire. Besides moorstone or granite, the mountainous parts of Devonshire afford the ores of tin, lead, iron, and manganese; and silver, gold, copper, bismuth, antimony, and cobalt have been found here, but in small quantities. The geological formation of the old red sandstone is so largely developed, that the term Devonian has become its synonym. The north-eastern part of the county, bordering on Exmoor, in Somersetshire, is a mountainous, dry, heathy district, including copper and lead mines. The rocks on the southern coasts furnish a close-grained limestone, capable of being polished as marble; and in the vale of King's Teignton clay used by pipemakers and potters is procured in large quantities.

Notwithstanding the general fertility of the soil and the mildness of the climate, agriculture is still in a somewhat backward state in this county, attributable, in part, no doubt, to the general preference given to dairy husbandry, to which, indeed, it is best adapted, from the extent and richness of its grass lands. The principal productions of the arable lands are wheat, barley, beans, pease, potatoes, and a little flax. In 1872 there were 308,195 acres under corn crops, 129,880 of which were taken up with wheat; in the same year there were 156,709 acres under green crops; 172,771 acres under clover, sainfoin, and grasses in rotation; and 400,202 acres in permanent pasture. There are six members of Parliament for the county, two representing East Devon, two North Devon, and two South Devon. The only city is Exeter, which is also a parliamentary borough. The other parliamentary boroughs are Barnstaple, Tiverton, Devonport, Plymouth, Tavistock. Butter, cheese, and live-stock are the staple products of the county; nor must that peculiar delicacy of its dairies, the 'clotted' cream of Devonshire, be overlooked. The butter is of excellent quality, and brings a high price in London, where most of it is sent; but the cheese is in general poor, being made mostly from skimmed milk.

Before the Roman invasion this part of Britain was inhabited by a powerful tribe called Damnonii, who carried on a commercial intercourse on the southern coast with the Phœnicians, Carthaginians, and Gauls; and under the Romans it was included in the province of Britannia Prima. Subsequently it became the theatre of severe contests between the

ancient inhabitants and the invading Saxons; and in 614 the former were defeated near Bampton by Cynegisl, king of Wessex, who added the Damnonian territory to his dominions. Two hundred years later the Anglo-Saxons maintained a defensive war against their enemies the Danes, who made repeated descents on the coasts of this county, and gained here a temporary ascendency in the reign of Alfred the Great, until their career was stopped by Oddune, earl of Devonshire. His victory over them in 878 shortly preceded the famous battle of Ethandune, which secured the independence of the kingdom. At the Norman conquest this county continued to be the scene of warfare after the general submission to the founder of a new dynasty; and Exeter, the capital, stood a regular siege before it submitted to the Conqueror. During the war between Charles I. and the Parliament several engagements took place in Devonshire, which was one of the counties most devoted to the cause of monarchy, and one of the last retreats of its partisans. The latest event of national importance which can be here noticed was the landing of William, prince of Orange, at Torbay, on the southern coast, November 5, 1688, preparatory to the revolution which placed him on the throne on the abdication of James II. Pop. in 1861, 584,373; in 1871, 601,374.

DEVONSHIRE, Duke of. See Cavendish.

DEW is a deposition of water from the atmosphere upon the surface of the earth. During the day the earth both absorbs and emits heat, but after sunset its supply of warmth is cut off, while it still continues to radiate heat into the surrounding space. Grass, flowers, and foliage being good radiators, lose after sunset the heat which has previously been absorbed by them, without receiving any in return, and their temperature consequently falls considerably below that of the atmosphere. From the proximity of these cold substances the particles of vapour in the adjoining air are condensed and deposited upon their surfaces in the form of dew, or of hoar-frost where the temperature of the earth is below 32°. When the sky is clouded the heat abstracted from the earth's surface by radiation is restored by the clouds, which, being good radiators, transmit an equal amount of heat to what they receive; and a balance of temperature being thus maintained between the earth and the surrounding atmosphere, no dew is formed. The deposition of dew is likewise prevented by wind, which carries away the particles of air before the vapour contained in them has been condensed by the heat imparted by the adjoining radiating substances. Horizontal surfaces, and those which are exposed to a wide expanse of sky, receive a greater supply of dew than sheltered or oblique surfaces, where circumstances diminish the amount of radiation. Thus in the plate of Snow, Hail, Dew, &c., fig. 29, where the vertical section of a country with considerable inequalities of surface is represented, the quantity of dew deposited on the open and horizontal surface A B will be greater than that deposited on the inclined surface B C, or the surface C D, which, though equally level with A B, is nevertheless much less exposed to the influence of the sky. Still more removed from the latter influence would be the valley at E. A ball of silk or cotton placed at H, on the level surface F G, is partially screened from the sky by the hedges at F and G, and will consequently be less covered with dew than if placed on the open plain A B. If a glass globe be suspended on a calm night a little above the ground, in an open space, the first particles of moisture will be formed on the summit of the ball, and others be formed in proximity to them as the radiation proceeds; but the drops of dew thus deposited will gradually diminish in size in receding from the summit of the ball, as represented in fig. 30 of the above plate. If a dead beetle be exposed in the like manner, a similar arrangement of the particles of dew, as in fig. 31, will be observed. A similar effect is shown by exposing a sheet of paper, with its surface bent into ridges, as in the section represented in fig. 32. The summits of the ridges will be covered with large particles of dew, diminishing in size as they approach the bottom of the furrows. An interesting method of observing the formation of dew is obtained by spreading out to the evening sky pieces of glass, the surface of which is at first merely dimmed by the moisture deposited on it, as in fig. 33. As the latter increases, however, the drops gradually enlarge, as in figs. 34, 35, 36, 37, till by their running into one another the moisture flows from the glass in small streams. Some curious results, exhibiting the regularity with which the depositions of dew take place, have been obtained by fastening pieces of wood (a good radiator) to the non-metallic side of a piece of gilt paper. A wooden cross being so attached, the triangular areas on the surface of the metal not in contact with the wood were covered with moisture, as in fig. 38. Where, on the other hand, the triangular areas were attached to corresponding pieces of wood on their under side, the intervening space on the surface of the metal appeared covered with moisture in the form of a cross, as in fig. 39. Fig. 40 represents the regularity with which the drops of dew arrange themselves round wafers placed on a piece of glass. In fig. 41 is represented the effect produced by partially covering a surface of glass with a smaller surface of metal. On an unclouded night the uncovered part of the glass will become cold by radiation, and extract heat from the metal, the outer edge of which, from its proximity to the cold glass, will receive the largest, and that part of the uncovered glass adjoining the metal the least deposition of dew. The effect of conduction on the formation of dew is shown in fig. 42, in the case of an iron plate fastened by screws to the top of a gate, where, on account of the heat derived by the screws from the wood in which they are fixed, the smallest particles of dew are deposited on the heads of the screws and the surrounding spaces.

An acquaintance with the cause which produces dew and hoar-frost enables us to understand the *rationale* of the process resorted to by gardeners to protect tender plants from cold, which consists simply in spreading over them a thin mat or some flimsy substance. In this way the radiation of their heat to the heavens is prevented, or rather the heat which they emit is returned to them from the awning above, and they are preserved at a temperature considerably higher than that of the surrounding atmosphere. To insure the full advantage of this kind of protection from the chill of the air, the coverings should not touch the bodies they are intended to defend.

The radiation from the earth's surface is one of those happy provisions for the necessities of living beings with which nature everywhere abounds. The heavy dews which fall in tropical regions are in the highest degree beneficial to vegetation, which, but for this supply of moisture, would, in countries where scarcely any rain falls for months, be soon scorched and withered. But after the high temperature of the day the ground radiates under these clear skies with great rapidity, the surface is quickly cooled, and the watery vapour, which, from the great daily evaporation, exists in large quantities in the atmosphere, is deposited abundantly. This deposition is more plentiful also on plants, from their greater radiating power; while on hard, bare ground and stones, where it is

less wanted, it is comparatively trifling. In cold climates the earth, being cold and sufficiently moist, requires little dew; accordingly the clouds, which are so common in damp and chilly regions, prevent the radiation of heat: the surface is thus preserved warm, and the deposition of dew is, in a great measure, prevented.

DEWBERRY (*Rubus caesius*), a plant belonging to the order of the Rosaceæ, and to the same genus as the bramble, from which it is distinguished by its smaller berries, with fewer grains, and by the bloom, resembling dew, with which they are covered, and from which the plant derives its name. Shakspeare mentions dewberries in the following lines in the Midsummer Night's Dream, although it is thought by some that gooseberries are what are there meant:—

> 'Feed him with apricocks and dewberries,
> With purple grapes, green figs, and mulberries.'

DE WETTE, Wilhelm Martin Leberecht, one of the leading theologians of the nineteenth century, born at Ulla, near Weimar, in January, 1780; died at Basel, June 16, 1849. In 1805 he qualified himself as a private instructor at the University of Jena; in 1807 he became professor of theology at Heidelberg, and in 1810 he was called to be the colleague of Schleiermacher at Berlin. In 1819 he was dismissed for having written a consolatory letter to the mother of Sand, the murderer of Kotzebue, after which he betook himself to Weimar, where he commenced the publication of the letters of Luther. In 1822 he accepted the chair of theology at Basel, where he remained till his death. In 1829 he was elected a member of the council of education in that town. The influence of De Wette's views upon the theological tendencies of his time was most important. He was remarkable for his critical acuteness, and for his powers of concise and clear exposition. His works are very numerous. Among them are: Beiträge zur Einleitung in das Alte Testament (Contributions to an Introduction to the Old Testament, Jena, 1806 and 1807); Lehrbuch der historisch-kritischen Einleitung in die kanonischen und apokryphischen Bücher des Alten Testaments (Historico-Critical Introduction to the Canonical and Apocryphal Books of the Old Testament, first edition, 1817; eighth, 1869); a continuation of the last work, Einleitung in das Neue Testament (Introduction to the New Testament, 1826); Lehrbuch der hebräisch-jüdischen Archäologie (Compendium of Hebraico-Judaic Archæology, 1814); Kurzgefasstes exegetisches Handbuch zum Neuen Testament (Short Exegetical Handbook to the New Testament, 1836–48). Of the above-mentioned collection of the letters of Luther, the first volume was published in 1825, the fifth in 1826, and a sixth was published posthumously in 1856. The above-mentioned works are all more or less of a critical nature; the following are the most important works in which he developed his own theological views: Lehrbuch der christlichen Dogmatik (Compendium of Christian Dogmatics, 1813–16); Christliche Sittenlehre (Christian Morality, 1819); and the didactic novel, Theodor oder des Zweiflers Weihe (Theodore, or the Consecration of the Sceptic, 1822).

DE WITT, Jan, grand-pensioner of Holland, celebrated as a statesman and for his tragical end, was the son of Jacob de Witt, burgomaster of Dort, and was born in 1625 or 1632. His father was imprisoned for some time on account of his opposition to Prince William II. of Orange. Jan de Witt inherited from his father republican principles, and a hatred to the house of Orange. After having carefully cultivated his talents he entered into the service of his country, and was one of the deputies sent by the states of Holland to Zealand, in 1652, to dissuade this province from conferring the office of captain-general on the young Prince of Orange, William III., who was but two years old. His eloquence procured him universal confidence; but to preserve this was almost impossible during the dissensions which raged in the states-general. One party was anxious, during the war between England and Holland, to have all power and honours conferred on Prince William III.; the other, with De Witt at its head, endeavoured to withdraw all authority from this prince, and entirely to abolish the stadtholdership. The war with England, sometimes fortunate, sometimes adverse, was injurious to commerce, and excited the displeasure of the nation against the latter party, of which excitement the Orange party took advantage to effect their purposes, until, in 1654, the former concluded a peace with Cromwell, with the secret condition that the house of Orange should be excluded from all situations of authority. Thus the republican party was victorious, and De Witt, as grand-pensioner, employed the time of peace in healing the wounds under which the state was suffering.

When Charles II. again took possession of the crown of England De Witt inclined to the side of France, which inclination became more powerful when in 1665 the war recommenced between England and the states-general. The Bishop of Munster, likewise, taking arms against the latter, the discontent of the people against De Witt became so great that he was compelled, in order to pacify them, to give up some privileges to the Prince of Orange, and to conclude peace with England in 1667. To increase the danger of De Witt's situation, Louis XIV. now began to manifest his intentions with regard to the Spanish Netherlands. The Orange party insisted on elevating Prince William to the dignity of his ancestors. De Witt succeeded in separating the offices of stadtholder and captain-general, and provided that, in Holland at least, he should be entirely excluded from the latter. The number of De Witt's enemies increased. He was obliged to conclude an alliance with England and Sweden (the 'Triple Alliance') against France, which produced the Peace of Aix-la-Chapelle, and was as quickly dissolved as it had been formed. Louis XIV., now united with England, invaded the Spanish Netherlands (1672). William's friends succeeded in procuring for him the post of commander-in-chief. The first campaign was unfortunate in its results, which were imputed to De Witt and his friends. The life of the former was endangered. William was nominated stadtholder by universal consent, and De Witt resigned his employments.

But the disposition of the people was little changed by this voluntary act, nor was the hatred of the Orange party satisfied. His brother Cornelius was accused of having attempted to assassinate the prince. He was imprisoned and put to the rack; but as he would not confess any such design, he was banished from the country, and his property confiscated. Hearing that his brother, while in prison, wished to speak to him, Jan de Witt hastened thither, when a tumult suddenly arose among the people at the Hague. The militia could not disperse the mob, the greater number of the officers being devoted to the prince. The people broke into the prison, and both brothers fell victims to their rage (Aug. 20, 1672). The states demanded an investigation of this affair, and the punishment of the murderers, from the stadtholder, which, however, never took place. That the opinions of De Witt's contemporaries respecting him did not agree may well be supposed, but all acquitted him of treason against his country. He was simple and modest in all his relations. He fell a victim to party spirit, nor could the friends of the house of Orange

accuse him of any other crime than that of not belonging to their party, and of aiming to elevate his own party at their expense. De Witt was an active political writer, and has left many excellent observations on the events of his time.

DEWSBURY, a town, England, in the West Riding of Yorkshire, and 30 miles south-west of the town of York, pleasantly situated on a hill above the Calder. Though irregularly, it is tolerably well built, and has an ancient parish church, and several other places of worship belonging both to the Establishment and to Dissenters. The prosperity of the town, which in recent times has advanced rapidly, is owing to the extensive manufactures of heavy woollen cloths, including blankets, carpets, rugs, flannels, baizes, &c. The London and North-western Railway has an elegant station here; and at Kirklees, in the vicinity, is shown the supposed tomb of Robin Hood, who occasionally resided and is believed to have died there. In 1867 Dewsbury was made a parliamentary borough, returning one member to Parliament. Pop. of mun. bor. in 1871, 24,764; of parl. bor., which includes the greater part of Batley, &c., 54,940.

DEXTRINE, or British Gum ($C_6H_{10}O_5$), a body obtained from starch and identical in composition with it. It differs from it in being soluble in water. In this respect it resembles gum; but on the other hand, it is distinguished from that substance by composition, by giving no precipitate with lead, by being, like starch, converted into oxalic acid by nitric acid, and not like gum into mucic acid, and especially by its causing a ray of polarized light to deviate to the right, a property from which it derives its name. It is prepared from starch by several processes. Vauquelin's method consists in heating the starch in an oven by vapour, or in a cylinder with oil, or in exposing it, spread in thin layers, to hot air until the starch becomes pale brownish-yellow. The temperature employed is about 350° F., or in the case of potatoes about 400° F., and the product is known as *torrefied starch*. In Payen's process the starch is moistened with water, acidified with nitric acid, dried in the air, powdered, and then heated in thin layers on trays in an oven to 240° F. for an hour and a half. The dextrine is colourless and almost entirely soluble in water. The transformation is also effected by dilute sulphuric acid at a temperature a little below that of boiling water. By acting upon starch with diastase (which see) dextrine is produced. To water at about 70° or 80° F., in a boiler, 8 or 10 parts of dried malt are added, and then 100 parts of starch after the heat is raised to 140° F. The mixture is kept stirred and the temperature maintained somewhat above this for twenty minutes, and then, when the thick mass has become quite fluid, it is raised to the boiling-point rapidly, cooled, the clear liquor filtered, and evaporated to a syrup. When cold it is an opaque gelatinous mass, which, on drying, becomes hard like gum. By the two last processes a certain amount of sugar is produced simultaneously, which can be removed by washing with alcohol. Dextrine is used in large quantities for thickening calico-printers' colours, for making adhesive paper and labels, and for postage stamps, as a varnish, and for many other purposes.

Animal dextrine is a body apparently identical with common dextrine, which has been obtained from the flesh and the liver of the horse.

DEXTRO-COMPOUNDS, bodies which cause the plane of a ray of polarized light to rotate to the right. Dextrine itself, tartaric acid, malic acid, cinchonine, and many other bodies have this property, while others, which have the opposite effect of causing the plane to rotate to the left, are called *lævo*-compounds.

DEY, a title formerly assumed by the rulers under the Turkish sultan of Algiers, Tripoli, and Tunis. The last two principalities are now called *Deylikz*.

DHALAK, an archipelago of the Red Sea, off the coast of Abyssinia, between lat. 15° 25′ and 16° 36′ N.; lon. 39° 25′ and 41° E., and forming a mid-station between Massowa on the one side and Loheia and Jiddah on the other. It consists of nearly 100 rocks and islets, mostly uninhabited, clustering round the island of Dhalak el-Kebir, which is about 35 miles long by 30 broad, and has a very irregular shape, being deeply cut into numerous bays and creeks. This island possesses a pearl-fishery. It was purchased by Great Britain in 1861.

DHAR, a small native state in Central India, to the west of Holkar's Dominions, about lat. 22° N.; lon. 75° E., with an area of about 1070 square miles. The soil is fertile, and yields rice and other cereals, Pop. 104,860. The capital is of the same name, 35 miles W.S.W. of Indore, was formerly of considerable extent, but is now without importance. Pop. 5000.

DHARWAR, a district of India, presidency Bombay, bounded N. by Belgaum, E. by the Nazam's Dominions and Bellary, S. by Mysore, and W. by the districts of Canara and Belgaum, Madras; area, 3837 square miles. A great portion of the surface consists of extensive plains; the soil, being generally dry and gravelly, is well adapted to the cotton plant, with with which about 270,000 acres are usually planted. A good deal of grain is also grown. The cultivation is generally conducted by ryots, with holdings of about 24 acres. About 250 lbs. of uncleaned cotton to the acre is an average yield. Pop. 754,385.

The capital, of the same name, is 275 miles S.S.E. of Bombay. It possesses three government schools —English, Mahratta, and Canarese.

DHAWALAGIRI, a peak of the Himalayas, in North Hindustan, lat. 28° 42′ N.; lon. 82° 32′ E., has an elevation of 26,826 feet.

DIABETES is an affection of a very peculiar nature, and which, both with respect to its origin, its proximate cause, and its treatment, has given rise to much controversy. Its most remarkable symptoms are: a great increase in the quantity of urine, a voracious appetite, a stoppage of the cutaneous perspiration, thirst, emaciation, and great muscular debility. The urine is not only prodigiously increased in its quantity, but likewise has its composition completely changed; the substance named *urea*, which it contains in the healthy state, is entirely removed, or exists in very small proportion, while in its stead we find a large quantity of sugar. (See Diabetic Sugar.) Whether diabetic differs essentially from vegetable sugar is to be regarded more as a chemical question than as what, in any respect, influences either our pathology or our practice; and it has been a subject of controversy whether there be a proper diabetes *insipidus*, that is, a disease attended with the increased discharge of urine, the voracious appetite, and the morbid state of the skin, but where the urine does not contain sugar.

Diabetes has been attributed to improper diet; to the use of spirituous liquors; to large quantities of watery fluids; to exposure to cold during perspiration; to violent exercise; and, in short, to anything which might be supposed likely to weaken the system generally, or the digestive organs in particular. It does not, however, appear that any of these circumstances so commonly precede the disease as to entitle it to be regarded as the cause, although many of them may contribute to aggravate it, or to bring it into action, when the foundation is laid in the constitution. The proximate has been no less the subject of controversy than the exciting cause; but it is now ascribed to a derangement of the function of

assimilation. With respect to the treatment which may afford the best chance of success, or which may possibly remove the complaint in its incipient state, we should recommend that a diet be employed of which farinaceous or saccharine matter, as well as fat, should form only a very small proportion, and because of the comparative absence of these substances in skim-milk we have in this a most excellent article of diet for diabetic patients. Many cases of a complete cure of this disease by the skim-milk treatment are on record; and there can be little doubt of this being the most satisfactory mode of treating this hitherto almost invariably fatal disease.

DIABETIC SUGAR was formerly supposed to be a distinct species of sugar, but it is now ascertained to be the same as glucose. It is regularly produced by the liver, and is a constant though trifling constituent of healthy urine, but in *diabetes mellitus* it amounts to 8 or 10 per cent., and the total quantity excreted per diem is in some cases very large. It can also be produced artificially in animals by curarine poisoning, by injecting sugar into the blood, by pricking the medulla oblongata, and by other ways. It is detected in the urine by fermentation, by the reduction of an alkaline solution of copper or of bismuth, and by the formation of compounds of the sugar with lime and magnesia.

DIABLERETS, Les, a secondary mountain-group of the Bernese Alps, Switzerland, between canton De Vaud and canton Valais. The highest peak has a height of 10,620 feet. Two peaks have already fallen, and others threaten to follow. The rocks consist of limestone, much deranged, and resting at a high angle on beds of shale, which becoming disintegrated leaves the limestone without support, and causes tremendous landslips. The most remarkable took place in 1714 and 1749. By the former the surrounding district was shaken as by an earthquake, and many human beings and cattle perished; by the latter the course of the Liserne was arrested, and two small lakes formed.

DIACHYLON. This substance is prepared by heating together oxide of lead or litharge, olive-oil, and water, until the combination is complete, and replacing the water as it evaporates. It is, therefore, a lead soap. It is a yellowish-white solid, insoluble in water, and sparingly soluble in alcohol, hard and brittle while cold, but softens and melts on heating, and at a higher temperature is decomposed, the organic matter being destroyed and lead left. It is used in surgery, and as the basis of other plasters.

DIADEM, a band of silk or woollen, invented, according to some, by Bacchus, to relieve the headache produced by excessive drinking. It more probably belonged to him as coming from the East (the Indies). It afterwards became the distinguishing ornament of royalty. The diadem of the Egyptian deities and kings bore the symbol of the sacred serpent. Among the Persians it was twined about the tiara of the kings, and was purple and white. The diadem of Bacchus, particularly of the Indian Bacchus, as seen in very old representations, consisted of a broad, plaited band, encircling the forehead and temples, and tied behind, with the ends hanging down. When unfolded it formed, in fact, a veil; and for this reason it was often called by the Greeks, *calyptra*, that is, *a veil*. It was afterwards attributed to other deities, and finally became the badge of kings. In the earliest times it was very narrow. Alexander the Great adopted the broad diadem of the Persian kings, the ends of which hung over his shoulders; and this mark of regal dignity was retained by his successors. On coins we see queens also with the diadem, with the addition of a veil. The early Roman emperors abstained from this ornament, to avoid giving offence to the people. Constantine the Great was the first who used it, and he added new ornaments to it. After his time it was set with a single or double row of pearls and other precious stones, so that it was somewhat similar to a Turkish turban.

DIÆRESIS (Greek, *diairesis*), a separation of one syllable into two, also the mark (¨) by which this separation is distinguished, as in *aërial*.

DIAGNOSIS, in medicine, the distinction of one disease from others resembling it, by means of a collected view of the symptoms.

Diagnostic symptoms are those most characteristic of any particular form or seat of disease.

DIAGONAL, Diagonal Line, a straight line joining two angles not adjacent, in a rectilinear figure having more than three sides. Every rectilinear figure may be divided by diagonals that do not intersect each other, into as many triangles as it has sides, *minus* two. To find the number of possible diagonals, take three from the number of the sides, multiply the remainder by the number of the sides, and halve the product.

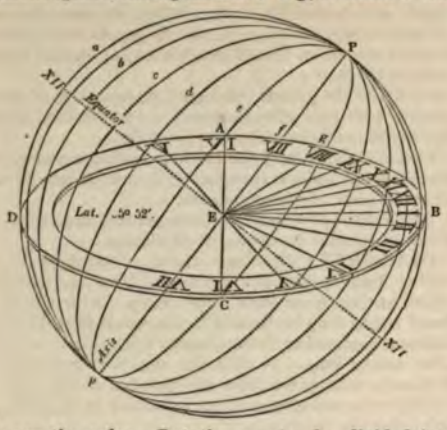
DIAGORAS, a poet and philosopher of antiquity, was born in the island of Melos, one of the Cyclades. He was a disciple of Democritus of Abdera, who taught about 436 B.C., and who is said to have ransomed him from captivity after the conquest of Melos by Alcibiades, B.C. 411. He spent a great part of his life in Athens, but was obliged to quit it on account of a charge of atheism arising from his disbelief in the popular polytheism. He is reported, for want of fire-wood, to have thrown a statue of Hercules into the fire to cook a dish of lentils. After his departure a reward of a talent was offered to any person who should bring his dead body to Athens, and two talents to any one who should deliver him up alive. Pallene in Achaia, which sheltered him, was included by the Athenians in the decree passed against him. From thence he went to Corinth, where it is supposed he died. Political causes are assigned for the strong hostility of the Athenians towards him. Like his teacher Democritus he substituted the active powers of nature for the divinities of the Greeks; and his attacks on the prevailing polytheism were of too fundamental a kind to be made with impunity. His life was exemplary.

DIAGRAM, a figure or geometrical delineation applied to the illustration or solution of geometrical problems, or a description or sketch in general. Anciently, it signified a musical scale. Among the Gnostics the name *diagram* was given to a figure formed by the superposition of one triangle on another, and inscribed with some mystical name of the Deity, and worn as an amulet.

DIAL, Sun. This instrument has been known from the earliest times; the Egyptians, Chaldeans, and Hebrews (Isaiah xxxvii. 8) were acquainted with the uses of it. The Greeks derived it from their eastern neighbours, and it was introduced into Rome during the first Punic war. A dial constructed for the latitude of Catania was carried off from that city and placed in the forum by Valerius Messala; but as there was a difference of 4° of latitude between the two cities it could not, of course, indicate the true time at Rome. Before this period the Romans ascertained the hour by the rude method of observing the lengths of shadows, or, in the absence of the sun, by the clepsydra (which see), which a slave was employed in tending.

The complete investigation of the theory of the formation of dials would require the application of the higher mathematics; but the leading principles of dialling may be made intelligible to general readers by the following simple illustration.

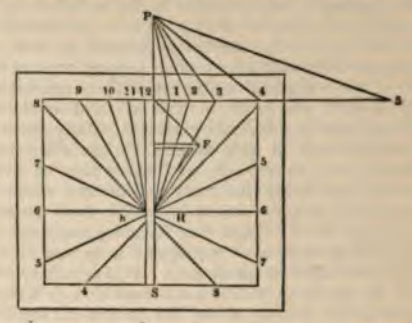
Let P B p D represent the earth as a hollow transparent sphere, having an axis P E p, of which P and



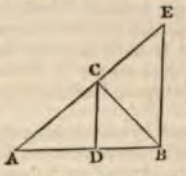
p are the poles. Let the equator be divided into twenty-four equal parts, and through these divisions draw the meridians a, b, c, d, &c. Let one of these meridians pass through any given place for which a dial is required to be made, and where that meridian cuts the equator let it be numbered XII. The opposite meridian must likewise be numbered XII., the other meridians being numbered as shown in the cut. This being done, these meridians will be the hour circles of the place on the first meridian; so that if the axis P E p were opaque, the sun in his (apparent) motion round the earth in twenty-four hours will pass from one meridian to another in one hour, and cause the shadow of the axis to fall on the hour on the plane D C B A. This diagram has been drawn for the latitude of Glasgow, 55° 52′, and the plane in its present position would form a horizontal dial for that place; but we may suppose it capable of moving round its axis A C, so as to assume different positions in the sphere. If it move round so as to become vertical, that is, at right angles to its position in the figure, we then obtain an erect south dial. The plane may also be made to incline from the meridian either towards the east or west. Thus we have dials of different kinds dependent on the position of the plane with regard to the first meridian, the position of the hour lines of which are all determined by the meridians of the sphere cutting the plane. In Plate XXXII. is given the form of a vertical dial, provided with a portable meridian, which may be adapted to the latitude of any place.

We have been considering the earth as the sphere, in our illustration of the nature of dials, but the earth's magnitude is so small compared with the distance of the sun, that no sensible error will follow in considering a small glass sphere similar to that above described, but placed on the surface of the earth with its axis parallel to that of the earth; then will the sphere show the hour of the day in the manner before specified. The only things absolutely essential for a dial are the axis and the plane, the places of the hour lines having been once determined. Dials may have various forms, many of which are exceedingly curious; and the reader who is desirous of becoming acquainted with them may consult with advantage Brewster's Ferguson's Lectures.

Many of these forms are very intricate, and require for their construction the application of complicated trigonometrical formulæ. We shall confine our attention here to the most common, and, at the same time, most useful form, that is, the plane horizontal dial. On the proposed plane, which may be either of marble, slate, or brass, draw the straight



line P H S for the meridian or twelve o'clock line, and parallel to this draw 12, h S, leaving a space between them equal to the thickness of the gnomon. The gnomon is a thin triangular disk of metal, somewhat similar in shape to the figure A E B, the side A B being fixed into the plate of the dial, so that the gnomon shall stand perpendicularly, the line A E being directly north and south. The line A E is called the style, and the angle E A B is equal to the latitude of the place for which the dial is constructed.



We return again to the consideration of fig. 2. Draw 6 H 6 perpendicular to 12 H S, and it will be the 6 o'clock hour line; make the angle 12 H F equal to the latitude of place, and draw 12 F perpendicular to H F; continue S 12 to P, making 12 P equal to 12 F. The line 12 1 2 3 4 is drawn parallel to the line 6 H 6. From the point P draw the lines P 1, P 2, P 3, &c., terminating in the line 12 1 2 3 4, making angles with the line 12 P at the point P of 15°, 30°, 45°, &c., increasing by 15 degrees each line. Next from the centre H draw the lines H 1, H 2, H 3, &c., and thus the hour lines of 1, 2, 3, 4, and 5 P.M. will be found. The hour lines on the other side of the style should now be formed by taking a tracing of the side already formed; the hours are of course numbered differently, and both sides will stand thus, the hour lines of both sides corresponding:—

$$12, \begin{matrix} 1, & 2, & 3, & 4, & 5, & 6, & 7, & 8 \\ 11, & 10, & 9, & 8, & 7, & 6, & 5, & 4. \end{matrix}$$

Here we have carried the hours beyond 6, which was the extent of the construction; but to find the hour lines for 4 and 5 in the morning we have only to produce the hour lines of 4 and 5 in the evening, and in like manner for the hour lines of 7 and 8 in the afternoon, produce the hour lines of 7 and 8 in the morning. The dial gives solar time, and, therefore, the time, according to it, will only agree four days in the year with a well-regulated clock. See EQUATION OF TIME.

The sun-dial is daily getting more rare in this country; but notwithstanding the superiority of the clock, why has the dial almost everywhere vanished? 'If its business use,' as has been well observed, 'be superseded by more elaborate inventions, its moral use, its beauty, might have pleaded for its continuance. It spoke of moderate labours—of pleasures not protracted after sunset—of temperance and good hours. It was the primitive clock—the horologe of the first world. Adam could scarce have missed it in paradise. It was the measure appropriated for

sweet plants and flowers to spring by—for the birds to apportion their silver warblings by—for flocks to pasture and be led to fold by. The shepherd carved it out quaintly in the sun, and, turning philosopher by the very occupation, provided it with mottoes more touching than tombstones.'[1]

DIALECT, a variety of a language. It is not always easy to determine the line where dialects begin or cease to be distinct languages. In ancient times this may have depended almost entirely upon direct intercourse; in modern times it depends partly upon direct intercourse; but still more upon literature. In some respects German, Danish, Swedish, Icelandish may be called dialects of the common Teutonic stock; yet a German is no more able to understand Swedish than Hebrew, if he has not studied it. It would not be correct, however, to lay it down as a rule that dialects are such forms of the common language as may be understood, if not entirely, yet in general, by all who speak one of the varieties of the common language, because a person who has never heard or spoken anything but High-German cannot understand the people of Lower Germany speaking to each other in their dialect, yet a Portuguese is generally able to understand Spanish, without having learned the language systematically.

The common meaning of the term *dialect*, in modern times, is the language of a part of a country, or a distant colony, deviating, either in its grammar, words, or pronunciation, from the language of that part of the common country whose idiom has been adopted as the literary language, and the medium of intercourse between well-educated people. In ancient times, when the great difficulties in the way of intercourse and communication between different parts of a country prevented, or at least impeded, the formation of a general language, each dialect was developed independently of the others, until some event gave to one the ascendency. In Greece we find four distinct dialects: the Ionic, Attic, Doric, and Æolic, each of which gave birth to literary productions still extant, until at last the greater refinement, and the cultivation of arts and sciences in Athens, gave the Attic dialect the superiority.

Although the use of provincial dialects becomes inconvenient after a language has acquired a fixed literary standard, the study of such dialects is always valuable to the philologist for the light they throw on the history of the language. They frequently also retain beauties which have been lost in the received language, and with which, when they admit of being restored, it may still be enriched. No one who has studied the peculiarities of the Provençal, the Low-German, or the Allemannic dialects, or the Neapolitan, with its many remnants of the Greek, can be insensible of the interest and value of such investigations.

Italian was once the vulgar dialect; and, even now, to translate into Italian is called *volgarizzare*. It was corrupt Latin mixed with barbarous words derived from the idioms of the conquerors of the country, and was used at first only by the lower classes; it then became the general dialect of common life; and at last Dante dared to adopt the 'vulgar dialect,' and to stamp it as a legitimate language.[2]

Spanish and Portuguese were cognate dialects, and might, like the different dialects of the Spanish provinces, have become one language, if the two nations had not been separated politically.

[1] '*Horas non numero nisi serenas*' ('I only count the hours of sunshine') was an ancient dial-motto of great beauty and significance.

[2] It must be observed that Neapolitan was written even before Tuscan; but Dante's greatness made the Tuscan at once the standard dialect.

In Germany no dialect has ever obtained entire ascendency. Much was once written in Low-German, and the activity of the Hanseatic league, and the wide extent to which it was spoken, gave it much influence. Charles V., born at Ghent, spoke Low-German; but Luther's translation of the Bible, like Dante's Divina Commedia, made High-German the literary language. Since that time it has changed very much, and has acquired, in many respects, a development of its own. It is a great mistake, common among foreigners, to consider Saxon as the Castilian or Tuscan dialect of Germany, because Luther was born in Saxony. On the contrary, the Saxon dialect is one of the most disagreeble to a German ear, and deviates much from the modern High-German. Only the fundamental characteristics of the language of Upper Germany have remained in High-German. In other respects it has developed itself independently of any provincial dialect.

Of English there are but two distinct literary dialects, the modern English and the Scottish, which is derived from the same Saxon stock. It has often been observed, however, that no country has more variations from the common literary language. The Scottish dialect exists in its purity only in the early poets, historians, and other writers of the country. Most of the modern literary Scotch is only a hybrid English made up by an infusion into the common language of local words and colloquial expressions. Every county has its peculiarities, which are sometimes striking and difficult to be understood. On the other hand, there never has existed a country so vast, and a population so large, as that of America, with so little variety of dialect, which is probably owing to the previous existence of a written language, the general diffusion of education, and the free communication between the different parts of the country.

DIALECTICS, the old name of logic, or the art of reasoning (from Gr. *dialegesthai*, to speak), because thought and reasoning are expressed by speech, and thus were first manifested, and the mind naturally proceeds from the obvious to the remote, from the particular to the general. Logic was early denominated, in conformity with this name, the *art of speaking* or *disputing*. By *dialectician* we understand a teacher of dialectics, or one who understands the art of logical disputation.

DIALOGUE, a conversation or conference between two or more persons. The word is particularly used in reference to theatrical performances, and to written conversations, or a composition in which two or more persons are represented as interchanging ideas on a given topic. The ancient philosophers, especially the Greeks, from their peculiar vivacity were fond of this form; they used it for the communication of their investigations on scientific subjects. The dialogues of Plato are a sort of philosophical dramas. The Socratic dialogue (so called) consists of questions and answers, and the person questioned is obliged, by successively assenting to the interrogatories put to him, to come to the conclusions which the questioner wishes to produce. This dialogue supposes in the interrogator a thorough knowledge of human nature in general, and of the person questioned in particular. The dialogue is now much used for verbal instruction. The philosophical dialogue seems but little adapted to our manners, and the present improved state of the sciences; and, being written, of course, with the view of establishing certain positions, the objections raised are only such as can be readily answered, and thereby assist in establishing the desired conclusions; but are not always such as present themselves to the reader, who is often dissatisfied with the result, because his own doubts are not settled. Erasmus of Rotterdam, and

subsequently, among the Germans, Lessing, Moses Mendelssohn, Engel, Herder, Jacobi, Solger, have written in this form. In comic and satiric dialogue Wieland has imitated the satirist Lucian. Among the most distinguished Italian writers of dialogue are Petrarca (De vera Sapientia), Machiavelli, Gelli, Algarotti, and Gozzi; and among the French, Sarrasin, Malebranche, Fénélon, and Fontenelle. Among the English, Bishop Berkeley and Hurd have imitated Plato, and Harris, Cicero. Lord Lyttleton's Dialogues of the Dead, and Addison's Dialogues on Medals, are well known, but Landor's Imaginary Conversations of Literary Men and Statesmen is the finest production in English belonging to this class of works. In the drama, the *dialogue*, in a narrower sense, is opposed to *monologue* or *soliloquy;* in the opera, it is that which is *spoken*, in opposition to that which is *sung*. See DRAMA.

DIALYSIS. By his investigations into the diffusion of solutions of different bodies, Mr. Graham found that the latter may be arranged in two classes, bodies which diffuse readily, such as sugar, salt, bichromate of potassium, which he designated *crystalloids*, and bodies which diffuse with difficulty or not at all, designated by him *colloids*, or bodies resembling glue or gelatin, such as gum, starch, caramel, albumen, the ordinary constituents of food, &c. &c. He further found that while a colloid body offers no obstacle to the diffusion of crystalloids, it checks or entirely stops the diffusion of another colloid, so that this property can be adapted to separate bodies of the two classes when they occur together in a solution, and to the process the name of *dialysis* was given. The apparatus, called a dialyser, is made by stretching a sheet of colloidal matter, paper covered with starch, a piece of bladder, or, better, of parchment paper, over a hoop or the mouth of a glass bell, open at the top, so as to form a shallow tray or cup. The solution to be dialysed is poured into the cup, which is then floated on water in a jar. In a short time all the crystalloid bodies will have passed through the membranous septum into the pure water, while the colloid matter will remain almost entirely in the dialyser. Mr. Graham investigated the rates of passage of different compounds, and found, of course, great differences in the rate of diffusion, but quite analogous to the rate of diffusion when no septum is employed. By means of this process a number of gelatinous or colloid substances have been obtained in solution which were never so obtained before, aluminic hydrate, ferric hydrate, silicic, stannic, and titanic acids, and some others. It was also proposed as a method of separating arsenic, strychnine, and other poisons, which are crystalloid, from the colloid contents of the stomach of a poisoned animal or from food, but this application has not been received with very much favour, other more delicate and convenient processes being known.

DIAMANTINA, a city, Brazil, formerly called *Tejuco*, and the chief town of the diamond district, is in the province of Minas Geraes, about 30 miles N.N.W. of Serro, or Villa do Principe. It is beautifully situated on an eminence, on the sides of which it rises in the form of an amphitheatre, presenting at a distance a very imposing appearance. The streets, though irregular and unpaved, are wide; and many handsome houses are seen both in the town and its suburbs, which are rendered additionally attractive by the profuse interspersion of banana and orange trees. The churches are generally handsome, and one of them, belonging to the negroes, has a figure of the Virgin painted in black over the altar. The inhabitants are almost all engaged in the gold and diamond trade. Population about 6000.

DIAMETER, the straight line drawn through the centre of a circle, and touching the two opposite points of the circumference. It thus divides the circle into two equal parts, and is the greatest chord. The *radius* is half this diameter, and consequently measures the distance between the centre and circumference of a circle. The length of the diameter is to the length of the circumference of the circle as 1 to 3·14159265 . . . , the latter number being an interminable decimal.

DIAMOND, the hardest and most valuable of all the gems. To the account of the diamond already given in the article CARBON we will only add at present that diamonds are of various colours; but the colourless, which is the sort mostly used in the arts, is, when pure, perfectly clear, and pellucid as the purest water. Hence the phrases, the *water* of a diamond, a diamond of the finest *water*, &c. The colourless diamonds are not, however, the most common. The rarest colours are blue—especially deep blue—pink, and dark brown; but yellow diamonds, when the colour is clear and equal throughout, are very beautiful, and much valued. Authors and composers of eastern tales long wrote of diamonds as being found in India only, and chiefly from the mines of Golconda; yet ever since the year 1728 these stones have been found in greatest abundance in Brazil, no less than 1146 ounces having been brought to Europe in 1730. In 1829 diamonds were discovered in the Ural Mountains, and about 1868 in the south of Africa. One of the largest known (weight 367 carats) was found in Borneo about a century ago; but the most notable of all is the *Koh-i-Noor* ('Mountain of Light'), literally the *gem* of the Crystal Palace of 1851, which was brought from Lahore the year before as a present to Queen Victoria. Its original weight, said to have been nearly 800 carats, has been reduced to 279. It was originally found in the mines of Golconda in the year 1550. It passed, in the train of conquest, from Golconda to Delhi, thence to Mushed, and thence to Lahore. Its early history and identification are, however, involved in some obscurity and confusion. Since it came to England it has been recut and its weight reduced to 103¾ carats.

The diamond is the hardest of all known substances. Nothing will scratch it, nor can it be cut but by itself. By cutting it acquires a brilliancy and play of lustre that augment its price as the square of the weight. The object aimed at in cutting a diamond is the production of the greatest possible play of colour, which is effected by cutting facets upon it inclined at certain angles to each other. The chief forms are the *brilliant*, the *rose* or *rosette*, and the *table*. The brilliant, as its name imports, shows the diamond to greatest advantage, but it requires a well-shaped stone. It consists of two truncated unequal pyramids set base to base, the flatter being uppermost. The top plane is called the table; it is eight-sided; upon each of the sides is placed a right-angled triangle called a star-facet; the cutting is completed by four large lozenges at the sides and four small lozenges at the corners, the rest of the space along the edges being occupied by triangles called skil-facets; there are thus thirty-two faces in all surrounding the table. The lower plane is called the culet or collet, and other planes are symmetrically cut around it, amounting altogether to twenty-four. The rose-diamond is one which is broad as compared with its depth, and does not admit of brilliant cutting. A different system is followed. Six triangles are cut on the top so that the apices of the triangles meet in a point called the summit. Round this central part are disposed more triangles, so that the upper curved surface is covered with twenty-four triangular facets. The under sur-

face is flat. The least valuable are table-diamonds, which are plates of the stone too thin to cut even in the rose form, and which have very slight play of colour. The hardness of the diamond was well known to the ancients, its name, both in Greek and Latin (ἀδάμας, *adamas*), implying invincible hardness. Very exaggerated accounts, however, have been given of its hardness, uninflammability, and other properties, and great therapeutic virtues have also been ascribed to it. The ancients did not confine the word *adamas* to indicate the diamond alone, but applied it to other hard and *adamantine* substances. They were unacquainted with the art of cutting the diamond, satisfying themselves with those which were polished naturally, but knew of the property of its powder or dust for cutting, engraving, and polishing other stones.

The art of cutting and polishing the diamond was unknown in Europe till the fifteenth century. Before that period rough and unpolished ones were set as ornaments, and valued according to the beauty and perfection of their crystallization and transparency. This art is said to have been invented and first practised in 1476 by Louis de Berquen, a native of Bruges. Charles the Bold, duke of Burgundy, was one of the first princes of modern times who affected a great splendour in diamonds. The diamond was not nearly so highly valued in the middle ages as the ruby. Lessing thinks that many of the engraved antique gems which are called diamonds are nothing but amethysts, sapphires, and emeralds deprived of their colour by the operation of fire. The internal structure of the diamond has been examined optically by Sir David Brewster, who has shown that almost every diamond contains one or more cavities filled with fluid or vapour, or some matter differing from the diamond, and exercising pressure upon the parts of the diamond surrounding it.

Diamonds are valuable for many purposes. They have been made into lenses for microscopes, and are used for jewelling watches. Their powder is the best for the lapidary and gem engraver, and more economical than any other material for cutting, engraving, and polishing hard stones. Glaziers cut glass with them, glass-cutters looking-glasses, and other articles of window and plate glass. The glazier's diamond is set in a steel socket, and attached to a wooden handle about the size of a thick pencil. It is very remarkable that only the point of a natural crystal can be used; cut or split diamonds scratch, but the glass will not break along the scratch as it does when a natural crystal is used. An application of the diamond, of great importance in the art of engraving, was successfully introduced by the late Wilson Lowry, to the purpose of drawing or ruling lines, which are afterwards to be deepened by aqua fortis. Formerly steel points, called *etching needles*, were used for that purpose; but they soon became blunt by the friction against the copper, so that it has always been impracticable to make what are called *flat* or *even* tints with them, such as the azure parts of skies, large architectural subjects, and the sea in maps; but the diamond being turned to a conical point, or otherwise cut to a proper form, is not worn away by the friction of the copper, and consequently the lines drawn by it are all of equal thickness. The diamond etching points of Mr. Lowry are turned in a lathe by holding a thin splinter of diamond against them as a chisel. A recent application of diamonds was for cutting the Mont Cenis tunnel.

DIAMOND, in technical language, is the rhomboid—that is, a quadrangle with equal sides and two obtuse angles; for instance, in patterns of calico.

DIAMOND NECKLACE, THE. See ANTOINETTE (MARIE); CAGLIOSTRO; LAMOTTE VALOIS; and ROHAN (LOUIS).

DIANA, an Italian goddess whom the Romans subsequently identified with the Greek Artemis. Servius Tullius is said to have dedicated a temple to her on the Aventine. Diana was the protectress of slaves, who held a yearly festival in her honour on the day of the dedication of this temple. She seems to have been originally the patron divinity of the Sabines and Latins. She was a virgin, and no man was allowed to enter her temple; in this and other respects she resembled the Roman Fauna Fatua.

The Greek Diana or Artemis was the daughter of Zeus (Jupiter) and Leto or Latona, and was the twin sister of Apollo, born in the island of Delos. There were various other local accounts of her origin. While yet a child, as Callimachus relates in his hymn, she entreated her father to suffer her to continue a virgin, because her mother's sufferings had rendered her averse from love. She desired him, at the same time, to give her a bow and arrows, a city, and rule over the hills, sixty Oceanides, and twenty river nymphs, and to permit her to bear a torch and hunt in the forests. Zeus gave her more than she asked. He caused thirty cities to be devoted exclusively to her worship, and appointed many others where she was venerated in common with other deities. Artemis then retired to the woods of the Leuci Montes in Crete; thence she went to the ocean, where she selected a numerous retinue of nymphs, nine years old. Her next journey was to the Cyclopes, on the island Lipara, of whom she asked a Cydonian bow, and a quiver and arrows. They executed the commands of the goddess, and she now appeared with her arms in the Arcadian territory of Pan, who presented her with some beautiful hunting-dogs. Thus equipped, at the foot of Mount Parrhasius, she took four beautiful stags, with gold antlers, and yoked them to her chariot. When she returned to the palace of the gods, loaded with game, Hermes and Apollo met her in the vestibule; the former took her weapons, and the latter the fruits of the chase. The river nymphs unyoked the stags from her chariot, fed them in Hera's meadows, and gave them water from golden vessels. Artemis then went into the palace of the gods, and sat by the side of Apollo. As he directs the chariot of the sun, she guides that of the moon. Eros and Aphrodite sought to conquer her in vain. Hunting, music, and dancing alone had charms for her. She punished without mercy those of her virgins who violated their vows of chastity. Actæon, the grandson of Cadmus, who secretly watched her as she was bathing, she changed into a stag, and his own dogs tore him in pieces. The beautiful Endymion, however, at length made her feel the power of love. While enlightening the earth as Selene (the moon), she beheld the hunter, fatigued with the chase, slumbering in the woods. She descended from her ethereal course, and kissed the lips of the youth, who enjoyed a favour never before granted to mortal or immortal. Notwithstanding her aversion to love, she afforded aid to women who called upon her in travail. She was also the goddess of death. She aimed her darts especially at the female sex, and brought the old, who were satiated with life, to a gentle death, to make way for the vigorous and blooming. When angry she destroyed with pestilence and disease, like her brother Apollo. When offended she revenged without compassion. Thus she slew Orion, the hunter, from jealousy, because Eos (Aurora) had fallen in love with him; so also the daughters of Niobe, because their mother preferred herself above Latona, &c. In the Trojan war both Artemis and Apollo aided the Trojans; and in the

war with the giants and Titans she proved her valour.

The worship of Artemis was spread through all Greece, and the various legends here related do not all refer to the same deity, it being common in ancient mythology to group together under the name of some celebrated divinity the local associations and traditions originally belonging to different mythical personages. She received many surnames, particularly from the places where her worship was established, and from the functions over which she presided. She was called *Lucina*, *Ilythyia*, or *Juno Pronuba*, when invoked by women in child-bed, and *Trivia* when worshipped in the cross-ways, where her statues were generally erected. She was supposed to be the same as the moon and Proserpine or Hecate, and from that circumstance she was called *Triformis;* and some of her statues represented her with three heads, that of a horse, a dog, and a boar. She was also called *Agroteta*, *Orthia*, *Taurica*, *Delia*, *Cynthia*, *Aricia*, &c. She was supposed to be the same as the *Isis* of the Egyptians, whose worship was introduced into Greece with that of Osiris, under the name of *Apollo*. The *Artemisia* was a festival celebrated in honour of her at Delphi.—At first she was represented with a diadem, afterwards with the crescent upon her head, with bow and arrows, a quiver over her shoulders, and a light hunting dress, together with her hounds. Her most famous temple was at Ephesus (which see), and was considered one of the wonders of the world. She was worshipped there as the symbol of fruitful nature, and represented with many breasts, encircled with numerous bands.

DIANA OF POITIERS, Duchess of Valentinois, born in 1499. She was the mistress of King Henry II. of France, and descended from the noble family of Poitiers, in Dauphiny. At an early age she married the Grand-seneschal of Normandy, Louis de Brezé, became a widow at thirty-one, and some time after the mistress of the young Duke of Orleans. When the duke became dauphin a violent hostility arose between Diana and the Duchess of Etampes, mistress of Francis I., who taunted her rival with her age. Diana satisfied her revenge by banishing the duchess on the accession to the throne, in 1547, of Henry II., in whose name she ruled with unlimited power. Till his death in 1559 she exercised such an absolute empire over the king by the charms of her wit and grace, that her superstitious contemporaries ascribed her power to magic. Upon his death she retired to her castle Anet, where she established a charitable institution for the support of twelve widows, and died in 1566. Medals are still to be seen bearing her image, trampling under foot the god of love, with the inscription, *Omnium victorem vici* (I have conquered the universal conqueror).

DIANA'S TREE (*arbor Dianæ*, or silver tree) is formed from a solution of silver in nitric acid, precipitated by quicksilver, and crystallized in prismatic needles, which are grouped together in the form of a tree. To make this beautiful process of crystallization visible to the eye, let a quantity of pure silver be dissolved in nitric acid; then dilute the saturated solution with twenty or thirty parts of water, and put in an amalgam of eight parts mercury and one part silver leaf, upon which, after some days, crystals are formed. The crystals consist of an amalgam of silver, or rather a definite compound of the silver and mercury. Copper-filings dropped into a solution of silver in aqua fortis produce the same effect; and such trees are often found in working silver ore, on the removal of the quicksilver. The name is formed from the supposed connection between the moon and the metal silver. The preparation itself is old, and is very well described in an alchemical writing professing to have been written in 1489. Thereafter it was often referred to by other chemists, and the term *arbor* was applied to other tree-like or mossy deposits of metals—for example, *arbor Saturni*, *arbor Martis*—produced by the action of some other metal.

DIAPER (French, *diapré*), so called from *Ypres* (*d' Ypres*), linen cloth woven in flowers and other figures; the finest species of figured linen after damask. Hence, as a verb, it signifies to diversify or variegate with flowers, or to imitate diaper.

DIAPHANOUS, translucent, that is, admitting light to pass through; a term but little used.

DIAPHORETICS are agents used in medical practice for producing perspiration. The effects of a free promotion of excretion from the skin are both sanatory and curative. It relieves congestion of the blood and inflammatory action in internal organs. A large portion of hydropathic treatment is specially designed to promote excretion, and warm and vapour baths, wet sheets, &c., are among the most useful of diaphoretics. A favourite form of this class of diaphoretics is the Turkish bath. Diluent drinks, especially hot, are frequently used, and various medicines are employed for the same purpose, among the most popular of which are opium and ipecacuanha, which in equal quantities by weight mainly form the well-known Dover's powder.

DIAPHRAGM, in anatomy, a large robust, muscular membrane or skin placed transversely in the trunk, and dividing the chest from the belly. In its natural situation the diaphragm is convex on the upper side towards the breast, and concave on its lower side towards the belly; therefore, when its fibres swell and contract, it must become plain on each side; and consequently the cavity of the breast is enlarged to give liberty to the lungs to receive air in inspiration; and the stomach and intestines are pressed for the distribution of their contents; hence the use of this muscle is very considerable. It is the principal agent in respiration, particularly in inspiration; for when it is in action the cavity of the chest is enlarged, particularly at the sides, where the lungs are chiefly situated; and as the lungs must always be contiguous to the inside of the chest and upper side of the diaphragm, the air rushes into them in order to fill up the increased space. In expiration it is relaxed and pushed up by the pressure of the abdominal muscles upon the viscera of the abdomen; and at the same time that they press it upwards they pull down the ribs, by which the cavity of the chest is diminished and the air suddenly pushed out of the lungs.

DIARBEKIR, a town, Asiatic Turkey, capital of the pashalic of same name. It stands on a high bank overlooking the Tigris, and is surrounded by a lofty massive wall, built of blocks of black porous stone, the best houses being also of the same material. The principal edifices are the great mosque, a fine structure with a square tower, and originally a Christian church; and the Armenian cathedral and Chaldean church, handsome buildings recently erected. The manufactures, once very extensive but now greatly decayed, consist chiefly of iron and copper ware, leather, silk, woollen, and cotton goods; the bazaars are well stocked with every description of goods, and a limited trade is carried on with Syria and Aleppo. Pop. about 13,000.

DIARRHŒA, a very common disease, which consists in an increased discharge from the alimentary canal, the evacuations being but little affected, except in their assuming a more liquid consistence. They are generally preceded or accompanied by flatulence, and a griping pain in the bowels, and frequently by sickness; but this should perhaps rather be attributed to the same cause which produces the

diarrhœa, than be considered as a part of the disease itself. The symptoms of this complaint are so obvious as seldom to leave any doubt respecting its existence; but there are two diseases that resemble it, and from which it is important to distinguish it—dysentery and cholera. For the most part an attention to the nature of the evacuations is sufficient to point out the distinction; or if, as occasionally happens, the diseases appear to run into each other, our remedies must be administered accordingly, always adapting them rather to the symptoms than to a technical nomenclature.

The exciting causes of diarrhœa are various; perhaps the most frequent is repletion of the stomach or the reception into it of some kind of indigestible food; cold applied to the surface of the body, and especially to the legs and feet, is also an exciting cause of diarrhœa; and it is occasionally produced by impressions upon the nervous system, or even by mere mental emotions. In children the peculiar irritation produced by teething seems to be a frequent exciting cause of diarrhœa as well as that which arises from the presence of worms in the alimentary canal. Diarrhœa is often symptomatic of some other disease; of these one of the most violent is the colliquative discharge from the bowels which occurs in the latter stages of hectic fever. It is also a frequent attendant or sequel of the affections of the liver that come on after a residence in hot climates, and is then found to be one of the most unmanageable symptoms of these diseases.

In its simple form diarrhœa is not difficult of cure, and perhaps, in a great majority of cases, would be relieved by the mere efforts of nature. The proximate cause of diarrhœa appears to be an increase of the peristaltic motion of the intestines, which may depend either upon a stimulating substance applied to them, or upon an increased sensibility in the part, rendering it more easily affected by the ordinary stimuli. In cases of the first description, which constitute a great majority of those that fall under our observation, the most effectual remedies are mild purgatives, given in small doses, and frequently repeated. Along with the purgatives large quantities of mild diluents will be found serviceable; and the food should be of the least stimulating kind, and be composed as much as possible of liquids. The choice of the purgatives will depend upon the state of the stomach, and various other circumstances: neutral salts, castor-oil, rhubarb, and magnesia are perhaps among those that are the most generally applicable: the last will be especially proper when we have reason to suspect an acid state of the alimentary canal. After the due exhibition of purgatives we shall generally find the complaint to subside without the use of any other remedies; and by a proper regulation of the diet the parts resume their healthy action. Considerable advantage has been gained by the use of warm clothing, and particularly of flannel worn next to the skin, in those who are subject to frequent attacks of diarrhœa; and sometimes it has appeared that the warm bath, or even the removal to a milder climate, has been of permanent utility.

DIAS, Bartolomeo, a celebrated Portuguese navigator of the fifteenth century. A gentleman of the court of John II., he was named in 1486 commander of one of that long succession of exploratory expeditions which the Portuguese court had during this century become distinguished for promoting. (See Colony.) His predecessors had already advanced far along the western coast of Africa. The two vessels composing the expedition sailed along the coast till they reached Cape Negro (lat. 15° 50′ s.), where Diego Cam, a previous explorer, had stopped. At a place called Sierra Parda, about 24° s., they erected a cross with the arms of Portugal. At 29° s. they anchored again at a point, to which they gave the name of Angra das Voltas (Bay of Detours). In sailing south from this point they were surprised to find the temperature descend to an intense degree of cold. After seeking land to the east, and failing to find it, they sailed north again, and landed at a bay to the east of the Cape of Good Hope, which they had already doubled, without discovering it. Following the coast they arrived at a point (33° 40′ s.) where Dias first discovered that they had accomplished their object of doubling the Cape, and here he erected a pillar with the arms of Portugal. He still wished to continue his voyage in order to discover the country of Prester John, but the sailors of his little fleet, which consisted only of two small vessels of about 50 tons burden, refused to accompany him, and taking formal possession of the country he set out on his return. In again doubling the Cape, he gave it the name of Cabo Tormentoso (Cape of Storms), which the King of Portugal changed to its present designation. He reached Lisbon in Dec. 1487. In 1497 Dias set out with the expedition of Vasco de Gama, which first reached the East Indies by way of the Cape, as commander of a small caravel, which, however, was not destined to complete the voyage, being appointed to a separate trading mission on the gold coast of Africa. He was again appointed in 1500 to the command of a vessel in the expedition of Cabral, which discovered Brazil. On their return they sailed for the Cape of Good Hope, where, in a tempest, they lost four vessels, one of them being that commanded by Dias, who thus perished on the scene of his great discovery on 29th May, 1500.

DIASPORE ($Al_2O_3H_2O$), monohydrate of alumina, containing traces of oxide of iron, lime, magnesia, and silica, is found in thin rhombic prisms or needles, massive, or in cellular masses, in Siberia, near Fahlun, in the island of Samos, and elsewhere. It is very hard and brittle; decrepitates on heating, hence its name; and is insoluble in boiling hydrochloric acid. It is colourless, and transparent, but sometimes has a tint of green or blue.

DIASTASE, a substance existing in barley, oats, and potatoes, but only after germination, and so called because when in solution it possesses the property of causing fecula or starch to break up at the temperature of 156° F., transforming it first into dextrine and then into sugar, identical with the sugar which is prepared from starch by acids. It is obtained by digesting in a mixture of three parts of water and one of alcohol, at a temperature of 113° F., a certain quantity of germinated barley ground and dried in the open air, and then putting the whole under pressure and filtering it. It is solid, white, and soluble in water and diluted alcohol, but insoluble in strong alcohol. If 200 parts of fecula be mixed with 1000 parts of water, and a portion of diastase be added, and the mixture kept at a temperature of about 156° F., the starch is converted gradually into dextrine and grape sugar. The action of diastase is prevented by acids, alkalies, and some salts, but not by alcohol or ether. A solution of diastase becomes acid, and loses its power on starch. The composition of diastase has not been exactly determined, but it is believed to be nitrogenous. A body having the power of converting starch into sugar exists in saliva and in the pancreatic fluid, but whether it is identical with diastase or not is uncertain. Diastase is used in the manufacture of dextrine (which see), and it has also been proposed for dissolving the starch and dextrine used by printers for thickening their colours.

DIATHERMANCY, a term of Melloni, designating the property that is possessed in various de-

grees by different substances of transmitting radiant heat. Bodies that are equally transparent, that is, bodies which have equal power of transmitting rays of light, are very different in their power of transmitting heat rays. Thus a thin plate of glass and a thin plate of rock-salt may be nearly equally transparent, but the plate of rock-salt has far superior power of transmitting rays of heat. This may be shown very simply. Let a delicate thermometer be placed near to a lamp (but not above it), the mercury will rise on account of the heat radiated to it. If a plate of rock-salt be interposed between the lamp and thermometer, the mercury will fall slightly: but if a plate of glass of equal thickness with the plate of rock-salt be interposed, it will be seen that the greater part of the heat is at once cut off from the thermometer. Melloni determined the diathermancy of various substances by means of the thermo-electric pile (see THERMO-ELECTRICITY). The face of the pile was exposed to heat radiating from various sources,—from a Locatelli lamp, from incandescent platinum, from copper plates heated to various temperatures—and plates of different substances and of different thicknesses were then interposed between the source of heat and the pile. The electric current generated by the heating of the pile was observed by means of a delicate galvanometer, called by him a *thermo-multiplier*, and from the indications of this instrument the amount of the total radiant heat allowed to pass by each substance was deduced. Rock-salt he found the most diathermanous of all the bodies he examined, 92 per cent. of the total heat from each of the sources being allowed to pass. Glass only permitted 39 per cent. of the total heat from the Locatelli lamp to pass, 24 per cent. from the incandescent platinum, 6 per cent. from a copper plate heated to 400° C., and from copper at 100° C., the temperature of boiling water, no perceptible portion of the heat passed through the glass plate. Other transparent bodies gave similar results.

From the example of glass just given it will be perceived that the *temperature* of the source is an important matter. Rock-salt was the only body that Melloni found equally diathermanous to heat from all the sources he used. All others showed a great decrease in their diathermancy, with a decrease in the temperature of the source. Rock-salt itself has since been shown by Balfour Stewart to be almost opaque, or *athermic*, as it is sometimes called, to heat rays issuing from a heated plate of its own substance. It is on account of its power of stopping the heat rays from low sources that glass is conveniently used as a screen from the fire, although it is by no means a screen from the heat of the sun. The transparency of bodies to light does not at all necessitate their diathermancy. Thus clear rock-crystal, which is transparent, and smoky rock-crystal, which is opaque, are nearly equally diathermanous; and solution of iodine in bisulphide of carbon, which is perfectly opaque to light, is highly diathermanous.

The diathermancy of plates of various thickness has also been determined. The diathermancy decreases very rapidly as the thickness increases. Thus, according to Pouillet, in case of a certain kind of glass a thickness of 0·5 millimetres allows 77·5 per cent. of the total radiation from a Locatelli lamp to pass, while a thickness of 5 millimetres only transmits 62·0 per cent. of it. For further information the reader is referred to Dr. Balfour Stewart's Treatise on Heat.

DIATHERMANOUS, permitting radiant heat to pass through. See DIATHERMANCY.

DIATOMACEÆ, Brittleworts, a sub-order of Algæ; plant a frustule, consisting of a unilocular or a septate cell; cells composed of two symmetrical valves, multiplying by spontaneous separation. There are two well-defined sections: 1. *Diatomeæ*, including species invested with a silicious epidermal covering, occurring both in fresh and salt water, often exhibiting exquisite sculpturings when seen under the microscope, and testing the highest powers of the instrument. 2. *Desmidieæ*, minute fresh-water plants of a green colour, without a silicious covering. The diatoms possessing a silicious epidermis have been eagerly studied of late years by microscopical observers, who have greatly increased the number of genera and species. They are universally distributed, and their silicious coverings being indestructible, their remains are accumulated and perpetuated in many localities, sometimes forming extensive deposits, as at the city of Richmond in Virginia, which is said to be built upon a stratum of these microscopically minute atoms 18 feet in thickness. Diatomaceous earth has been found in many parts of Great Britain, as at Peterhead, Dolgelly, Lough Mourne, Raasay, Cantyre, Mull, &c. Species of *Arachnoidiscus* and other genera of great beauty are obtained from guano. The *berg-mehl* or mountain-meal of Sweden consists of diatoms. The mud at the mouths of many rivers, the sediment of ponds, ditches, and even rain-troughs, contains myriads of the same minute organisms. They were found by the Arctic navigators investing the fields of polar ice; and they have also been detected in the dust evolved from volcanoes.

DIATONIC (from the Greek), a term in music, applied by the Greeks to that one of their three genera which consisted, like the modern system of intervals, of major tones and semitones. It is applied in modern music to the natural scale.

DIATRIBE (Greek, *diatribé*) originally signified a sustained discourse or disputation, afterwards came to be applied to a violent criticism, whether written or spoken. It is used in the same sense in French.

DIAZ, MIGUEL, a Spanish explorer, one of the companions of Christopher Columbus, was born in Arragon in the second half of the fifteenth century, and died in 1514. He took part in the second voyage of Columbus, and was one of the colonists of the island of St. Domingo. He quitted the colony in 1495 in consequence of a duel, and took refuge with a few of his companions in the southern part of the island, where he married a native. Through the advice of his wife he discovered the gold mines in this part of the island, the existence of which he communicated to Bartolomé Columbus, whereby he reconciled himself with the colonists, and led the way to the foundation of the town of Nueva Isabella, afterwards called St. Domingo. He was made governor of Porto Rico in 1509, but his fidelity to the family of Columbus repeatedly brought him into trouble. After being arrested and brought to Spain he was restored to his government in 1512.

DIBBLE is an instrument or machine used in gardening and agriculture. The common garden dibble is merely a round piece of wood, about 1½ inch in diameter, with a tapering point, used for making holes in the ground, into which seeds or plants are inserted. More complicated apparatus, called dibbling machines, which not only prepare the ground but throw in the seed, are now frequently used in agricultural operations. These machines are very various in construction, and they are only one variety of the numerous sowing-machines now in use. They are thus distinguished in Morton's Cyclopedia of Agriculture:—'In the whole class of dibbling machines the seed is not merely laid at intervals in a continuous channel, but it is deposited at intervals in cup-shaped cavities on the surface of the land.'

DIBDIN, CHARLES, an English dramatic manager and poet, composer and actor, was born at South-

ampton in 1745. At the age of fifteen he made his appearance on the stage, and was early distinguished as a composer. He excited uncommon admiration, and soon gained friends and a sufficient support. He invented a new kind of entertainment, consisting of music, songs, and public declamations, which he wrote, sung, composed, and performed, himself, and by this means succeeded in amusing the public for twenty years. His patriotic songs were very popular, and his sea-songs are still the favourites of the British navy. Their favourable influence on the lower classes obtained him a pension of £200 from government. Improvidence, however, kept him constantly poor. He died in 1814.—His son, CHARLES DIBDIN, composed and wrote many small pieces and occasional songs. See also next article.

DIBDIN, THOMAS, second son of Charles Dibdin, the celebrated writer of sea-songs, early displayed the same dramatic tastes as his father, and in 1775, when only in his fourth year, was brought upon the stage as the Cupid of Shakspeare's Jubilee, while Mrs. Siddons personated Venus. He was apprenticed in his sixteenth year to an upholsterer, but broke his indentures by joining a company of strolling players. After being connected with various theatres, and writing great numbers of songs, he returned to London in 1795, wrote a number of dramas with great success for the minor theatres, and obtained an engagement at Covent Garden, with which he continued connected for fourteen years. Among his numerous pieces the best known are Mother Goose, by which the theatres are said to have netted a profit of £20,000; the High-mettled Racer, which was almost equally profitable; The Cabinet; The Jew and the Doctor; and Past Ten o'Clock, which still keep their place on the stage. The latter part of his life was spent in very indigent circumstances. He died in 1841, in his seventieth year.

DIBDIN, THOMAS FROGNAL, a celebrated English bibliographer, was the son of the elder brother of Charles Dibdin, the celebrated naval song writer. He was born in Calcutta in 1776, and, being left an orphan, his education was undertaken by his uncle, Mr. Compton, who sent him to Oxford, after which he studied law and practised as a provincial counsel at Worcester. Failing in the law, he took orders in 1804. His bibliographical taste first developed itself in the pride he took in collecting choice copies of the Greek Testament. He became a popular preacher in London, and was well known there as a bibliomaniac. He proposed a club to dine together in honour of bibliography, which was established in 1812, under the name of the Roxburghe Club, and he became its first vice-president. This club adopted a rule that each member should every year reprint a book for presentation to all the members. In 1818 he made a foreign tour to purchase books for Earl Spencer, by whose patronage he was afterwards promoted to the rectory of St. Mary's, Bryanstone Square. He died 18th November, 1847. Of his numerous writings those connected with bibliography are alone of any value, and these are disfigured by great inaccuracies. Among them may be noted Bibliomania (1809); Bibliographical Decameron (1817); Typographical Antiquities of Great Britain (1810–19).

DIBRANCHIATA. See CEPHALOPODA.

DICE, cubical pieces of bone or ivory, marked with dots on each of their six faces, from one to six, according to the number of faces. Sharpers have several ways of falsifying dice: 1. By sticking a hog's bristle in them, so as to make them run high or low, as they please; 2. By drilling and loading them with quicksilver, which cheat is found out by holding them gently by two diagonal corners; for, if false, the heavy sides will turn always down; 3. By filing and rounding them. But all these ways fall far short of the art of the dice-makers, some of whom are so dexterous this way that sharping gamesters will give any money for their assistance.

Dice are very old. The Latin word for dice, *tesseræ*, is derived from the Greek *tesseres*, Ionic for *tessares*, four, because it is on every side square. Numerous passages in the ancient writers, and very many representations in marble or paintings, show how frequent dice-playing was among them. Different from the *tesseræ*, which were precisely like our dice, were the *tali* (which means, originally, the pastern bone of an animal—Greek, *astragalos*). These were almost of a cubic form, and had numbers only on four sides, lengthwise. Three *tesseræ* and four *tali* were often used together, and the game with dice was properly called *alea*, though *alea* afterwards came to signify any game at hazard, and *aleator* a gambler. Dice-playing and all games of chance were prohibited by several laws of the Romans, except in December, yet the laws were not strictly observed.

DICHROIC CRYSTALS, so called from their property of exhibiting two colours when polarized light is passed through them in different directions. Thus *dichroite*, a mineral observed by Haüy, appears deep-blue in the direction of the principal axis, and yellowish-brown in a direction at right angles to it, even when viewed with ordinary light. Brewster gives a list in his Optics of over thirty crystals which exhibit this property with the aid of a polariscope. The name *trichroic* is applied to crystals which exhibit three colours when viewed in three directions.

DICHROISM (Gr. *dis*, double, and *chrōs*, colour), the property exhibited by some crystals of appearing of two colours when light passes through them in two directions, having certain relations to the form of the crystals. There is also *trichroism* and *polychroism* in crystals. The *dichroscope* is an instrument for observing this property.

DICHROITE is a silicate of magnesium, iron, and aluminium, containing a little water and sometimes calcium and manganese, which readily undergoes modifications and passes into other minerals. It forms large, thick, trimetric prisms, or occurs massive or in grains. Its specific gravity is 2·6. It is very hard, fuses with difficulty, and is slowly attacked by acids. It is found in many places, both in Europe and in America. A beautiful blue variety from Ceylon is used as a gem. The name *dichroite* was originally given to it by Cordier because the specimen he examined exhibited two different colours when viewed by transmitted light—a deep blue along the principal axis, yellowish-brown at right angles to it. It has been subsequently shown that if a cubical piece be cut out of a crystal and examined three different colours are transmitted along the axes of the cube, and different colours are reflected from the faces. As therefore the term dichroite for the mineral and 'dichroism' for the optical property are hardly appropriate, it has been proposed to call the mineral *Cordierite* and the property *poly-* or *pleochroism*.

DICK, THOMAS, LL.D., a popular author of considerable merit, was born at Dundee in 1774, and educated for the Secession ministry, in which church he held a charge for some time in Stirling, but subsequently relinquished it, and was for many years a teacher in Perth. Latterly he resided at Broughty-Ferry, on the north bank of the Tay, near Dundee. The bent of his mind was towards science, and more especially its bearings on the subject of religion, the connection of which with the former constitutes the theme of most of his writings. These include the Christian Philosopher (1823), the work with which Dr. Dick's name is generally associated; the Philoso-

phy of Religion (1825); Philosophy of a Future State (1828); Celestial Scenery (1838); the Sidereal Heavens (1840); the Practical Astronomer (1845); and others. All of these display great scientific knowledge and accuracy, and from the interest of their matter, as well as the piety of sentiment pervading them, have all attained a large and deserved popularity. Dr. Dick was a man of a singularly amiable and unobtrusive disposition, but during the greater part of his life was in straitened circumstances, the profits derived from his works being extremely small. Some years before his death a small pension was granted to him by government. His works have been several times reprinted in America, and translated into various languages. He died 29th July, 1857.

DICKENS, Charles, one of the greatest English writers of fiction, was the son of Mr. John Dickens, who for some years previous to the conclusion of the war with France was in the employment of the Navy Pay Department, and having retired with a pension on the return of peace, subsequently became a parliamentary reporter. Charles Dickens was born in February, 1812, at Landport, Portsmouth, where his father at that time resided. Owing to the frequent changes of residence which his father's occupation made necessary, his earliest years were passed at Plymouth, Sheerness, Chatham and other seaport towns. He was afterwards placed in an attorney's office, with the intention of preparing him for the legal profession, but a passion for literature, which had developed itself in the perusal of novels and dramas, gave a different bent to his mind, and he was allowed to follow it by exchanging his occupation for that of a newspaper critic and reporter. His first engagement as a reporter was on the Mirror of Parliament and the True Sun, two papers apparently under one proprietorship. He soon exhibited eminent ability both as a reporter and a depicter of scenes in city life, and in 1835 he was engaged on the Morning Chronicle, edited by Dr. Black, then one of the leading daily papers of the metropolis. On the 9th of June, 1835, appeared the first of the series of Sketches of Life and Character by Boz, which were published in the evening edition of that paper, under the title of Thoughts about People, by Boz.

For some years previous to this Dickens had been an original contributor to literature. From 1832 to 1835 he contributed various humorous pieces to the old Monthly Magazine, under the pseudonym of Timothy Sparks. In 1836 appeared a pamphlet entitled Sunday under Three Heads: As it is; As Sabbath Bills would make it; As it might be made; by Timothy Spark, 49 pp. 18mo, with four engravings by H. K. Browne, published by Chapman and Hall. This tract is remarkable as indicating the earliest connection of Dickens with his principal publisher and illustrator. In the Library of Fiction, published by Chapman and Hall in 1836–37, appeared the Tuggs of Ramsgate, and A Little Talk about Spring and the Sweeps, contributed by Dickens. He also appears about the same time to have contributed some papers to Bell's Life, as a sketch in that paper appears to have formed the ground-work of a comic opera, The Village Coquette, written by him in 1836, and set to music by Hullah. A farce from his pen, called the Strange Gentleman, was performed in the St. James' Theatre in 1836.

The sketches by Boz, Illustrative of Every-day Life and Every-day People, collected from the Morning Chronicle of 1835–36, were published by Macrone in 1836, in two vols., with illustrations by George Cruikshank. From this publication may be dated the origin of Dickens' fame. Mr. Hall, of Chapman and Hall, engaged the successful debutant to prepare the letterpress for a series of comic sketches on sporting subjects by Seymour, an artist who had already achieved fame, and suggested as a subject the adventures of an eccentric club. Seymour committed suicide soon after, and Browne joined Dickens as illustrator, but the star of Dickens was already in the ascendant. He reduced the number of illustrations in each part of the publication from four to two, increased the letterpress, liberated himself from the trammels imposed by the machinery of a club, and produced the immortal Pickwick Papers. The great characteristics of Dickens' genius were now fully apparent, and his fame rose at once to the highest point it was possible for a writer of fiction to reach. The richest and most buoyant humour pervaded the work, culminating in electric sparks of wit; and scenes of sensational comicality, like the trial of Mr. Pickwick, carried ridicule to the point of sublimity. Nor was this all. A new class of characters, eccentric to the last degree, but so life-like as to become at once personal and familiar acquaintances, Mr. Pickwick, Mr. Winkle, Mrs. Bardolph, the Wellers, and a host of others, were forced upon society, which had no choice but to receive them, albeit the suspicion might arise that various phases of its own humours were being hit off in these extraordinary beings. The Posthumous Papers of the Pickwick Club appeared under the name of Boz, while Browne as illustrator took that of Phiz. They were published in two vols. 8vo, by Chapman and Hall, in 1837.

The next important literary engagement of Dickens was with Mr. Bentley. Bentley's Magazine, started in 1837, was edited by him for two and a half years (five vols.), under the pseudonym of Boz. In these volumes, among other contributions, appeared his next great work, Oliver Twist, which opened up a vein of pathetic description of suffering from neglect and wrong-doing, and of indignant denunciation of the causes of such suffering which was henceforth to form a distinguishing feature of his works. Oliver Twist was published by Bentley in 1839 in three vols., with twenty-four illustrations by Cruikshank. In the same year the Memoirs of Joseph Grimaldi, edited by Dickens, were published also by Bentley. Before the completion of Oliver Twist, Nicholas Nickleby was begun, and like Pickwick was published in monthly shilling parts. It was issued complete in 1839 by Messrs. Chapman and Hall. Accompanying it, besides the usual illustrations, is a portrait by Maclise, in which the author is represented as 'a somewhat dandified young man in a high velvet-collared coat.' As the special object of Oliver Twist was to expose the conduct of workhouses, that of Nicholas Nickleby was to denounce the management of cheap boarding-schools.

Master Humphrey's Clock, issued in threepenny weekly numbers, contained among other matter two other leading tales, The Old Curiosity Shop, and Barnaby Rudge, the latter a historical tale, going back to the times of the Gordon riots. It was published as a complete work in three vols., by Messrs. Chapman and Hall, 1840–41. The introductory matter and the other tales have never since been republished. In 1841 Dickens also edited a collection of tales in three vols. called the Pic-nic Papers, published for the benefit of the family of Mr. Macrone, his first publisher, who had recently died. He contributed to it the preface and the first tale, The Lamplighter's Story. In 1841 he visited America for the first time. Here many aspects of society struck him in a curious light, and on his return he wrote American Notes for General Circulation (Chapman and Hall, 1842). His next novel, Martin Chuzzle-

wit, dwelt again on his American experiences. This work gave a new extension to his fame by the introduction of a fresh series of inimitable characters. The sanctimony of Mr. Pecksniff, the brutality of Jonas Chuzzlewit, the jollity of Mark Tapley, and the eloquence of Sarah Gamp, like many of Dickens' previous characters, immediately became typical. It was published, like the previous works, in twenty monthly shilling parts, and afterwards in one vol. in 1844, by Chapman and Hall, with twenty-four illustrations by Phiz.

The series of Christmas Tales, in which a new element of his genius, the power of handling the weird machinery of ghostly legend in subordination to his own peculiar humour, and guided by the inspiration of his own moral purpose, excited a new sensation of wonder and delight. These tales, which may here be enumerated consecutively, were, A Christmas Carol, in prose, with four illustrations by Leech, first edition published by Chapman and Hall, 1843; The Chimes, illustrated by Leech, Doyle, and Stanfield, first edition published by Bradbury and Evans, 1844; The Cricket on the Hearth, illustrated by Maclise, Doyle, Leech, and Landseer (Bradbury and Evans, 1845); The Battle of Life, illustrated by Maclise, Doyle, Leech, and Stanfield (Bradbury and Evans, 1846); The Haunted Man and the Ghost's Bargain, illustrated by Tenniel, Leech, Stanfield, and Stone (Bradbury and Evans, 1847). These five tales were reproduced in one vol. by Chapman and Hall in 1852. The extraordinary popularity of these tales created for a time a new department in literature. They were followed by imitators of the highest distinction, Thackeray, Lemon, Brough, James, Gore, &c., and, in fine, every publisher deemed it his duty or his interest to produce some sensational tale or series of tales for the holiday season. The natural result followed. The over-taxed imagination of the stock writers refused to produce novelties, and the public became disgusted with the *réchauffé* of worn-out ideas.

In 1845 Dickens went to Italy, and paid a visit to Rome. On his return a new enterprise awaited him. The Daily News, started on 1st January, 1846, was intrusted to his editorial management; but, despite his early training, this was an occupation uncongenial to his mind, and in a few months the experiment was abandoned. In the first number of the Daily News appeared the first chapter of his Pictures from Italy, which were published the same year in one vol. 8vo by Bradbury and Evans. Immediately after this followed Dealings with the Firm of Dombey and Son, Wholesale, Retail, and for Exportation, in the usual form, and which was issued in one vol. 8vo by Bradbury and Evans in 1848. David Copperfield followed, through the same publishers, in 1849–50. This was in many respects his greatest work. It was to a considerable extent autobiographical. In 1850 Dickens commenced to edit the weekly serial, Household Words, in which various original contributions from his own pen appeared. In 1853 Bleak House was completed in the same form and manner as the preceding works. A Child's History of England, commenced in vol. v. of Household Words, was published by Bradbury and Evans in three vols. 8vo, 1852–54. Hard Times appeared in Household Words, Nos. 210–229. It was published in one vol. 8vo, by Bradbury and Evans, in 1854, with the title Hard Times for these Times. Little Dorrit, commenced in 1856, dealt with imprisonment for debt, the contrasts of character developed by wealth and poverty, and executive imbecility, idealized in the Circumlocution Office. In 1859, in consequence of a disagreement with his publishers, All the Year Round superseded Household Words; and in the first number of this periodical, 28th May, was begun A Tale of Two Cities. Great Expectations followed in the same paper, on 1st December, 1860. Both were republished by Chapman and Hall, the first in one vol., the second in three vols. They are generally considered as the poorest of Dickens' works. In All the Year Round also appeared a series of disconnected sketches, called The Uncommercial Traveller, published in one vol. by Chapman and Hall, 1868. These are chiefly interesting as indicating the materials with which Dickens worked. The republication of further sketches of the same kind is yet looked for. Our Mutual Friend, completed in 1865, and published in the usual form, with illustrations by Marcus Stone, was the last great serial work which Dickens lived to finish. It afforded new proof of the elasticity of his genius. Hitherto most of his great works, while full of character and incident, and remarkable for the number and variety of personal sketches introduced in them, were nearly destitute of plot. Our Mutual Friend, while equally crowded with busy personages, alive with every variety of social activity, and while containing some studies of character of unusual breadth and depth, embraces a plot of sufficient complication to baffle the penetration even of the practised novel reader. This may be the place to say a few words on the distinguishing characteristics of Dickens' genius. He has not been without his detractors, and those who think most meanly of his productions plainly call him a caricaturist. It has been justly pointed out that there are certain fields in which other writers of fiction have excelled in which he does not find himself at home. History is not his forte, and he does not disport in the sphere of pure imagination. All his work is based upon actual observation. The city in particular, and the common life of the middle and lower classes in it, are his especial province. Again, it has been said that he has never produced any character of unusual elevation, and although on this a good deal might be said, it may perhaps be conceded that he rises with less liberty than some others into the higher regions of self-sacrifice and devotion to duty. But when every legitimate restriction has been made, the sphere of Dickens is a vast one, and it has been nobly occupied. The descriptive title prefixed to the first of his works, *illustrative of every-day life and every-day people*, may be applied to them all. Never was a writer more constant to his aim. Independent of the particular object of particular works, there is a constant effort to reach the hidden springs of action that lie lost to common observation in the hearts of men and women who perform the common drudgery of life. It is to this effort that his great success is due. It is the sudden development of these motives, whether good or bad, that has created those telling delineations of character, often seemingly grotesque, but always with a reality which stamps them on the memory, and makes them pass current like a sort of mental coinage which represents a given value wherever it comes. The number and variety of Dickens' characters, too, when a general view is taken of all his works, must place him in the highest rank as a delineator of human nature. If caricature consists in magnifying beyond their just proportion particular traits of character, then many of Dickens' sketches must be pronounced caricatures. But it must be observed that this is an expedient resorted to in kindred arts besides that of literature for serious purposes. How else can art, with its imperfect resources, interpret nature? In dealing with the common actions of common people, if the minute traits which reveal character are not thrown into strong relief, they will escape notice altogether, and the result will be a mere insignificant record of insignificant events.

Other writers before and after Dickens have minutely described the incidents of every-day life, and this has been the most common result. The art which reveals these traits in their power, instead of in their actual development, may be compared in its results with the microscopic analysis of the physiologist. Caricature differs from this art in being a mere irregular and meaningless distortion of the features of nature. It is true that Dickens is not to be judged by the ordinary rules of literary art as to the form of his productions. Other writers of greatly inferior power have been far more severe and regular in their observance of the laws of form; but for creative humour of the highest rank, that species of humour which is allied to the highest qualities of imagination, he has had few equals in our own or any other age.

The first number of Dickens' last work, The Mystery of Edwin Drood, was issued on 1st April, 1870, and only three numbers had appeared when he died somewhat suddenly, at his residence, Gad's Hill Place, near Rochester, on 9th June. Other three numbers of Edwin Drood were published from the MSS. he had left, but the story remained unfinished.

There are few incidents in the life of Dickens, unconnected with the history of his works, which require to be noticed in a sketch like this. He married in 1838 the daughter of George Hogarth, a musical writer and critic. In the same year he openly avowed the authorship of Pickwick. He had a decided taste for theatricals, and was a successful amateur performer. He frequently turned his talent in this way, and as a public speaker, to charitable purposes. He was also an admirable reader, and during the last fifteen years of his life he made frequent reading tours through the United Kingdom, in which he gave semi-dramatic readings from his own works to large audiences, by whom they were received with high appreciation. By the success both of his works and of his readings he accumulated a considerable fortune. He visited the United States of America a second time in 1867–68 on a reading tour. The enthusiastic reception he met with caused him somewhat to modify the severe opinions he had expressed in his American Notes, and a sort of apologetic note was prefixed to the next edition of them, with the desire expressed that it should accompany all future editions. He was one of the founders of the Guild of Literature, and in many other ways took an interest in charitable schemes, especially in connection with the literary profession and its collateral branches. He was buried in Westminster Abbey.

DICTATOR, an extraordinary magistrate of the Roman Republic. The office, as well as the name, appears to have been of Latin origin. The dictatorship was instituted at Rome B.C. 501. At first no one was eligible to the office who had not been previously a consul. The power of naming a dictator, when an emergency arose requiring a concentration of the powers of the state in a single superior officer, was vested by a resolution of the senate in one of the consuls. Along with the dictator, a *magister equitum*, or commander of the cavalry, was appointed, usually by the dictator himself; this officer was a sort of vice-dictator. Originally the dictator was always a patrician. A plebeian dictator was first appointed B.C. 356. The dictatorship was limited to six months, and the person who held it could not go out of Italy. This rule was laid aside during the first Punic war. The dictator was also forbidden to appear in Rome on horseback without the permission of the people, and he had no control over the public funds without the permission of the senate. He had the power of life and death, and could punish without appeal to the senate or people. All the other magistrates were under his orders. He had twenty-four lictors, double the number allowed to the two consuls. Such were the dictators appointed to carry on the government of the state in special emergencies; but dictators were likewise often appointed for temporary purposes, especially during the absence of the consuls. These temporary officers usually resigned the office as soon as they had performed the functions for the discharge of which it was conferred. The object of these temporary appointments was generally to secure the discharge of some function which could only be lawfully performed by the first magistrate of the state, as the holding of the comitia for the elections. The last dictator intrusted with the government of the state under the republic was appointed B.C. 216, the last temporary dictator B.C. 202. The office was revived by Sulla B.C. 82, and afterwards held by Cæsar B.C. 48, but in these cases the legal restrictions were not regarded, and the office bore no resemblance but in name to the ancient dictatorship. It was abolished during the consulship of Antonius, B.C. 44.

DICTIONARY (from the Latin *dictio*, a saying, expression, word), a book containing the words, or subjects, which it treats, arranged in alphabetical order. By *dictionary* is understood, first, a vocabulary, or collection of the words in a language, with their definitions; secondly, special works on various branches of science or art prepared on the principle of alphabetical arrangement, such as dictionaries of biography, law, music, medicine, &c. This use of the term is comparatively modern. When a work of this kind embraces all the subjects of human knowledge, or any wide range of them, it is commonly called an encyclopædia, but the distinction between the dictionary and the encyclopædia is not well preserved. Special dictionaries again, having a narrower range, are called glossaries or vocabularies. The Greek word *lexicon* is also sometimes used as synonymous with dictionary.

The most celebrated dictionary of the English language is that of Dr. Johnson, which was published in 1755, in two vols. folio. An abridgment by the author appeared in 1756, in which many of the words were omitted. Mr. Todd added in his own second edition of Johnson's Dictionary (1827) more than 15,000 words. More recently, English dictionaries, somewhat similar in plan to Dr. Johnson's, have been published by Dr. Richardson and Dr. Latham. A valuable work on English Etymology is the Dictionary of English Etymology by Hensleigh Wedgwood (2d edition, 1872). The American Dictionary of the English Language, by Noah Webster, two vols. 4to (New York, 1858; Abridgment, 8vo, Boston, 1829), is a work of merit and of great labour. Of this dictionary numerous editions, both complete and abridged, have been published in this country as well as in America. The Large American Dictionary by Dr. Worcester should also be mentioned. Dr. Ogilvie's English Dictionary, Technological and Scientific (based on Webster), with additions of many thousand words from other standard dictionaries, encyclopædias, and other sources, known as the Imperial Dictionary, may be mentioned as one of the best works of reference on the English language.

DIDACTIC POETRY. The word *didactic* is derived from the Greek *didaskein*, to teach; and a didactic poem is one of some length, the object of which is to impart instruction in the form of poetry. It is a matter of question whether didactic poetry really deserves to be classed with lyric, epic, and dramatic, because either the chief object of the poem is to give instruction on a certain subject, in which case the elevation, invention, and freedom of poetry are excluded; or, if this is not the prominent object, then

every poem is more or less didactic. If there are any poems really deserving the name, that ought to be called didactic, it is those which veil the purpose of instruction under the universally admitted forms of poetic composition, as in the case of Lessing's drama of Nathan the Wise; or clothe the lessons of wisdom in a symbolical or allegorical garb, as in the case of many visions, &c. Many of the early sacred poems of the different nations are, in this sense, didactic, and most, perhaps all, of these didactic poems partake of the symbolical character. Even Dante's grand poem (see DANTE) would, in this point of view, be justly called didactic. Also fables, parables, poetic epistles, and descriptive poems, are numbered, in this sense, among those of the didactic kind. There is hardly a subject, however prosaic, which has not at some time been treated in a didactic *poem*, so called. Didactic poetry, taking the phrase in its narrower sense, will always be a meagre and poor kind of composition; but when it passes into poetic description, it may attain an animated and elevated character. Lively and beautiful descriptions, for instance, exist of hunting, fishing, husbandry; but it is not to be denied that they lose in didactic as they gain in poetical character. Even the noble work of Lucretius, De Rerum Natura, on the system of Epicurus, and the charming Georgics of Virgil, suffer to a certain extent from their subservience to a didactic purpose. Among the English didactic poets are Davies, Akenside, Dryden, Pope, Young, Cowper, Darwin, and Wordsworth; among the French, Boileau, Louis Racine, J. B. Rousseau, and Delille; among the Germans, Opitz, Haller, Hagedorn, Cronegk, Lichtwer, Tiedge, &c.

DIDELPHIA. The more correct name for the group of mammals familiarly known as Marsupials, which are in strictness the only order in the subclass *Didelphia*. See MAMMALIA, MARSUPIALIA.

DIDELPHYS. See OPOSSUM.

DIDEROT, DENIS, a French writer and philosopher, was born in 1713, at Langres, in Champagne, and educated in the school of the Jesuits, and afterwards at Paris, at the College of Harcourt. His father intended that he should pursue the profession of law, and entered him with a *procureur* in Paris; but the youth found greater attractions in literature. Neither the indignation of his father nor his consequent want of means could deter him from his favourite pursuit; and he found resources in his own talents. He applied himself zealously to mathematics, physics, metaphysics, and the belles-lettres, and soon became distinguished among the wits of the capital. His earliest works were his Essai sur le Mérite et le Vertu (1745), and his Pensées Philosophiques (1746)—a pamphlet against the Christian religion, which found many readers, and in consequence of which he was imprisoned at Vincennes: the parliament caused it to be burned by the public executioner. The attention which this pamphlet received encouraged him to continue in the same course, though he was not bold enough to proceed further with the Pensées. His Lettre sur les Aveugles, à l'Usage de Ceux qui Voyent (London, 1749), is said to contain a profession of materialistic atheism. This work cost him an imprisonment in Fort Vincennes. In his Lettres sur Sourds et Muets, à l'Usage de Ceux qui Entendent et qui Parlent, he treats of the origin of our perceptions. His early works were stimulated by the necessity of providing the means of subsistence. Among them was Dictionnaire Universelle de Médecine (six vols. folio), a translation undertaken along with some collaborateurs of an English work. The Encyclopædia was begun in like manner as a translation of Chambers'; but he soon enlarged its plan and made it the vehicle for advocating his philosophical views. His chief collaborateur was D'Alembert, who assisted in expanding the plan of the work; among the other collaborateurs were D'Aubenton, Marmontel, Le Blond, and Le Monnier. Besides revising the whole Diderot at first undertook the mechanical arts, with which he made himself practically acquainted, and subsequently made contributions in history, philosophy, and art-criticism. The Encyclopædia, begun in 1749, was twice suspended by authority, but was at last allowed to proceed. During the time he was occupied with it, nearly thirty years, Diderot engaged in numerous other works, dramas, art-criticism, romances, &c. The profits of all his labour were so small that at last he found himself compelled to sacrifice his library. The Empress of Russia purchased it for 50,000 livres, allowing him the use of it as her librarian, with a salary of 1000 livres. A lively but licentious romance, Les Bijoux Indiscrets; and two sentimental comedies, Le Fils Naturel and Le Père de Famille, appeared during the intervals when his Encyclopædia was suspended. The latter are often printed under the title Théâtre de Diderot, and accompanied with a treatise on the dramatic art, which contains many ingenious observations. In 1773 he visited St. Petersburg, along with Grimm, in order to thank his benefactress. Catharine received him with great honour. On his return to France he lived in retirement, and died in 1784. He was often in very straitened circumstances, and it is said that in 1741, when he was twenty-eight years of age, returning to his lodgings one day after having fasted all day, he was taken ill. His hostess gave him some bread steeped in wine, and he made a vow, which he is said to have kept, never to refuse relief to an indigent person, lest another human being should be exposed to such sufferings as he had himself endured. The charge of atheism has been made and denied of Diderot both by friends and enemies. His own writings would appear not to be very consistent on the matter.

Several excellent productions of his were published after his death. Among them are his Essai sur la Peinture; likewise a dithyrambic poem, written in 1772, Abdication d'un Roi de la Fève, which contains democratical opinions; and two lively tales, La Religieuse (Paris, 1796) and Jacques le Fataliste et son Maître (Paris). Of Diderot was first said, what has been often repeated, that he had written some fine pages, but had never made a good book. He was a man of brilliant talent and warm imagination, but his works are deficient in plan and connection, and disfigured with pretension, obscurity, and arrogance, though characterized by energy, and sometimes even by eloquence. His Memoirs and Correspondence were published at Paris in 1831 (four tom. 8vo.) The most complete edition of his works is that of Brière, in 1821, in twenty-two vols. 8vo. The Encyclopédie appeared in twenty-eight volumes, folio, of which eleven were plates, from 1751 to 1772; a supplement of five volumes, including one of plates, was published in 1766–67. We refer the reader to a masterly essay upon Diderot, by Carlyle.

DIDIER, or DESIDERIUS, last King of the Lombards, was Duke of Istria, and happening to be in Tuscany in 756, where Astolphus, the previous king, died childless, immediately raised an army and laid claim to the throne. Rachis, who was the brother of Astolphus, and had abdicated in his favour to enter the monastery of Monte Cassino, appeared to oppose him, but the contest, after raging for some time, was suddenly terminated by the interference of Pope Stephen II., who ordered Rachis back to his convent. Didier was immediately crowned, but soon became involved in quarrels with the pope, who claimed the cession of large and indefinite grants which Pepin

had extorted from Astolphus and bestowed upon the popedom. Didier escaped the danger by skilful negotiation, and seemed moreover to have secured the permanence of his dynasty by marrying his daughter to Charlemagne in 770. The marriage, however, proved unfortunate; and when Charlemagne dissolved it by repudiation, the quarrel between the families became irreconcilable. Didier having afterwards been irritated by the interference of Pope Adrian I. in the family disputes, invaded the Papal States, and had made a conquest of a part of them, when Charlemagne interfered, and in 773 crossed the Alps with an army. Didier, unable to oppose him, shut himself up in Pavia, when, after a siege of a year, he was obliged to surrender at discretion. Charlemagne confined him in the monastery of Corbie, where he is said to have become perfectly reconciled to his fate, and to have died in the odour of sanctity.

DIDO, or ELISSA, the reputed founder of Carthage. According to some she was the daughter of Agenor (Belus); according to others, of Carchedon of Tyre, from whom Carthage received its name; others call her father Mutgo or Muttinus. Her brother was Pygmalion, king of Tyre. Her father married her to her uncle Acerbas, otherwise called Sichæus or Sicharbas, one of the richest Phœnicians, who was also the priest of Hercules, and to whom she was strongly attached. He was murdered before the altar by her brother, who was instigated by the desire of making himself master of his wealth. The spirit of her husband appeared to her in a dream, disclosed the crime, besought her to flee, and informed her where she could find his treasures, which Pygmalion had sought in vain. She therefore set sail for Africa, with all her wealth and her faithful companions, taking on board a number of young women at Cyprus, who were necessary for the establishment of a new colony. They landed on the coast of Africa, not far from Utica, a Tyrian colony, the inhabitants of which received her with the greatest kindness, and advised her to settle in the place where she first landed. She purchased of the natives as much land as might be covered with the hide of a bull, which she cut into the thinnest possible stripes, and surrounded with it a large extent of territory. Here she first built the citadel of Byrsa, and afterwards Carthage, which soon became an important place. Hiarbas, a neighbouring prince, paid his addresses to her. Unwilling to accept and unable to refuse the proposal, she sacrificed her life on the funeral pile. By an anachronism which is common with poets, Virgil attributes her death to the faithlessness of Æneas. Dido was worshipped in Carthage as a goddess. See CARTHAGE.

DIDOT. This family of printers and booksellers at Paris have distinguished themselves by their liberality and skill in their art, and by their many fine works, so that they may be justly ranked with the Elzevirs.

1. FRANÇOIS-AMBROSE, son of the printer and bookseller François Didot, born in 1730, invented many of the machines and instruments now commonly used in the typographic art. From his foundry came the most beautiful types that, up to that period, had been used in France, and he was the first person in France who printed on vellum paper. He took the greatest care to have his editions correct. By the direction of Louis XVI. he printed a collection of the French classics for the use of the dauphin. The Count d'Artois employed him to print a similar collection. He died in 1804.

2. PIERRE-FRANÇOIS DIDOT, brother of the former, born in 1732, succeeded his father in the bookselling business, and distinguished himself by his bibliographical knowledge. He also became printer to Monsieur, afterwards Louis XVIII. He had a great share in the changes made in the character of types, and contributed to the advancement of his art. He published some very fine editions; among them the Voyages d'Anacharsis. He died in 1795.

3. PIERRE DIDOT the elder, who also carried his art to perfection, son of François-Ambrose, born in 1761, succeeded his father in the printing business in 1789. His first work was to finish the collection for the dauphin, begun by his father. But he was not satisfied with accomplishing this. In the universal impulse which the arts received from the revolution he aimed at becoming the Bodoni of France, and conceived the plan of a splendid edition of the classic authors in folio, which should excel, if possible, the best editions extant. He spared no expense to adorn them with all the splendour and elegance of the arts of design, and availed himself of the aid of the first masters. He even sacrificed a part of his property to this favourite object. His Virgil (1798) was worthy of these endeavours, and still more so his Racine of 1801, which the French regard as the first typographical production of any age or country. Only 250 copies of these works were struck off. Among the productions of his press, Visconti's Iconography is particularly distinguished. Didot devoted the efforts of ten years to the improvement of the types, and caused eighteen different sorts, with new proportions, to be cut, with which he printed Boileau and the Henriade in 1819. Didot paid no less attention to correctness and purity of text, and perfect consistency of orthography, than to typographical beauty. He is also known as an author. He composed prefaces in Latin to Virgil and Horace, and was author of several works in French, poetry as well as prose. He received marks of honour from the republic, from Napoleon, and from Louis XVIII.; the latter conferred on him the order of St. Michael.

4. FIRMIN DIDOT, brother of the preceding, printer and type-founder, born 1764; died 1836. He was inventor of a new sort of writing, and an improver of stereotype printing.

5. HENRI DIDOT, son of Pierre-François, and nephew of the two preceding, early distinguished himself as a type-engraver. He then applied himself particularly to improve the method of founding types, in which he succeeded by the invention of a new founding apparatus. He called his process *fonderie polyamatype*. It is more expeditious than the former mode, and the types are much cheaper.

6. AMBROISE-FIRMIN DIDOT, born 1790; and HYACINTHE-FIRMIN DIDOT, born 1794, sons of Firmin Didot, succeeded in 1827 to the business of their father, and have since occupied a distinguished position among the publishers of Paris.

DIDYMÆUS, a surname of Apollo, either because he was the twin-brother of Diana, or from the double light of the sun and moon, which he lends to men. Under this name Apollo had one of the most famous of his temples and an oracle at Didyma among the Milesians. Pindar calls Diana *Didyma*.

DIDYMIUM, one of the rarer chemical elements occurring in allanite, cerite, cryptolite, gadolinite, orthite, parisite, and one or two others. The mineral afterwards called cerite when first examined yielded a brown powder which was supposed to be simple, but which was considered by Berzelius, who examined it, as the oxide of a metal which he called cerium after the then lately discovered planet Ceres. More than thirty years afterwards Mosander examined the brown powder and found in it the oxides of two metals, to one of which he gave the name *lanthanum*, because it had lain so long concealed, the other *didymium*, because it is always associated with lanthanium, and resembles it so closely. Its properties

have been further studied by Marignac. The oxides of these two metals occur along with other oxides in combination with silica, and their separation, founded upon the different solubilities of their sulphates or nitrates, is a tedious operation. The treatment of course depends upon the mineral employed, but after decomposition by hydrochloric or sulphuric acid, removal of silica, &c., the oxalates of the three metals are precipitated from the acid solution, dried, and ignited, when the brown powder is obtained. From this the cerium is separated by dilute nitric acid, or boiling with ammonic chloride, or by passing a current of chlorine gas through the oxides suspended in potash. In each case the didymium and lanthanum dissolve, and they are afterwards separated by conversion into sulphates, which are added to ice-cold water and warmed, whereupon sulphate of lanthanum deposits, and a rose-coloured solution remains, from which sulphate of didymium is got by crystallization. The sulphate of didymium is converted into chloride, and this reduced by sodium or by potassium yields the metal.

Didymium has in this way been got as a gray powder containing little fused or crystalline particles, but its metallic characters can hardly be said to be known. It is apparently oxidized by water in the cold, and is dissolved by hydrochloric acid with effervescence. The chief compounds are the oxide, a white powder which forms a gelatinous pale pink hydrate, and dissolves readily in acids, the sulphide, a green compound decomposed by acids, the chloride, the sulphate and nitrate, rose-coloured crystalline salts, very soluble in water, the oxalate, insoluble in water, and a few others.

The most characteristic property of didymium and its compounds is displayed in its relations to light. When a ray is allowed to pass through a layer of a solution of a didymium compound, and then viewed by a prism, several well-defined black lines called absorption-bands are observed intersecting the spectrum in different parts, and especially in the yellow. By means of them a very small quantity of didymium can be detected in the solution. The width, intensity, and number of these lines, and to some extent also their position, vary with the particular salt of didymium present, and especially, whether the solution be examined with ordinary or with polarized light. Differences are also observed when the crystals are examined as well as the solutions. If didymium oxide fused with microcosmic salt be heated on platinum in a colourless flame it gives an emission spectrum of bright lines corresponding with the dark bands of the absorption spectrum. By proper adjustment the passage of the dark bands into bright lines can be made quite visible. In its relations to light didymium resembles erbium.

DIE (ancient *Dea Augusta*), a town, France, department of Drôme, 26 miles south-east of Valence; pop. 3874. It is an ancient town which existed under the Romans, and still contains many important remains. It is pleasantly situated, surrounded by walls flanked with towers, and well built. The principal buildings are the cathedral, Calvinistic church, and an old Episcopal palace. Die was long a stronghold of the Protestants, and flourished till its prosperity was destroyed by the revocation of the edict of Nantes.

DIÉ, St. (ancient *Fanum Deodati*), a town, France, department of Vosges, on the Meurthe, 25 miles E.N.E. of Epinal; pop. 10,472. It stands at the foot of Mount Ornion, has regular and handsome streets, is the see of a bishop, and possesses a communal college and a public library. It was long famous for its abbey of Jointure, which counted among its abbots one pope and nine princes of the house of Lorraine. There are three springs of mineral water at St. Dié, one ferruginous, one sulphurous, and one acid. Both iron and copper are worked to some extent in the vicinity; there are marble quarries; and a variety of manufactures are carried on in the town.

DIEBITSCH-SABALKANSKI, Hans Karl, a Russian general, born at Grossleippe in Silesia, in 1785, was educated at the military school of Berlin, but in 1801 quitted the Prussian service for that of Russia, in which his father then held the rank of major-general. He was admitted into the grenadier guard regiment of Semenoff, and was present at the battles of Austerlitz and Friedland, in the former of which he was wounded, and after the latter obtained the rank of captain. In 1812 he became quartermaster-general to the corps of Count Wittgenstein, and in 1813 was attached as general to the division of Field-marshal Barclay de Tolly, whose niece he married in 1815. At the battle of Dresden he had two horses killed under him, and at that of Leipzig rendered services which were rewarded with new promotion. After Bonaparte's return from Elba he was appointed a general of division, and accompanied Barclay de Tolly into Germany and France, but on the death of that distinguished soldier returned to St. Petersburg. In the Turkish campaign of 1828–29 he acquired new fame by the storming of Varna, and after he obtained the chief command, by the passage of the Balkan, for which his surname of Sabalkanski was conferred upon him. On the breaking out of the Polish revolution in 1830 he was commander-in-chief of the Russian army, but failed to display the great talents which had previously distinguished him. Shortly after the battle of Ostrolenka he moved his head-quarters to Kleczewo, near Pultusk, where he was seized with cholera on the evening of 9th June, 1831, and died next morning.

DIEFFENBACH, Johann Friedrich, one of the most distinguished surgeons of modern times, was born at Königsberg in Prussia, in 1792, and educated at the gymnasium of Rostock. In 1810 he commenced the study of theology, but the following year, under the influence of the patriotic feelings then prevalent in Germany, entered as a volunteer a regiment of Mecklenberg chasseurs, and shared in the campaigns of 1813–14. He returned to his theological studies, but soon exchanged them for those of medicine, and more especially surgery. In 1821 he accompanied a blind lady to France as her physician, and on his return determined to go to Greece and fight in the war of independence. He had proceeded as far as Marseilles when a friendly lady brought him back to Germany. In 1822, when taking his degree at Würzburg, he delivered a very remarkable thesis, entitled Nonnulla de Regeneratione et Transplantatione. He settled in Berlin, and soon attracted universal notice by his talent as an operator. In 1830 he was appointed chief surgeon to the charity hospital, and in 1832 extraordinary, and in 1840 ordinary professor of clinical surgery. Besides the eminent skill which he displayed in performing ordinary operations, he distinguished himself by the improvement of many old and the invention of several new instruments. In particular, surgery is indebted to him for new methods of forming artificial noses, eyelids, lips, cheeks, &c., and curing squinting, stammering, &c. Among his numerous writings, to which his many avocations have sometimes prevented him from giving the necessary literary perfection, are Surgical Experiences (Chirurgische Erfahrungen, Berlin, 1829–34); a continuation of Scheele's work on the Transfusion of Blood and the Injection of Medicaments into the Veins; on the Dividing of Sinews and Muscles; on the Cure of Stuttering; and above all his great work, entitled Practical Surgery (Die

Operative Chirurgie, 2 vols. Leipzig, 1844–48). His health had begun to give way in 1845, but he continued his active duties till 1847, when he was suddenly cut off in the midst of his students.

DIELECTRIC, a name applied by Faraday to any medium through or across which electrostatic induction can take place (see INDUCTION, ELECTROSTATIC). One of Faraday's greatest discoveries in electricity was the fact that electrostatic induction is not, as was supposed by all previous naturalists, *action at a distance*, but in reality takes place by means of the particles of the insulating medium which separates two conductors that are influencing each other inductively. He proved the truth of his view by showing that different insulating media have different powers of transmitting the inductive influence; he named the medium a *dielectric*, and the measure of the power of the medium as a dielectric, he called its *specific inductive capacity*. Taking the specific inductive capacity of common air as unity, he obtained numbers for other dielectrics, such as glass, shell-lac, gutta-percha, by comparing them with air.

DIĔLYTRA, a genus of plants belonging to the natural order Fumariaceæ or Fumitories. The best known in this country is the *D. spectabilis*, a native of Northern China and the neighbouring parts of Siberia, which was discovered in 1810, and is now everywhere common in Europe as a garden plant. It blossoms in April and May, and its long drooping racemes of purplish red blossoms present a very graceful appearance. It grows freely in the open air, and only requires the protection of glass in the winter. It prefers a sunny position and a light but fertile soil, and may be propagated by division of the root. In Germany it receives the popular name of pendant heart or virgin's heart, from the shape of the blossoms.

DIEMEN, ANTON VAN, governor-general of the Dutch East Indies, was born in 1593, at Kuilenburg in Holland. Having been unsuccessful as a merchant, and pressed by his creditors, he went to India, where his excellent penmanship procured him the place of a clerk, and he speedily rose to the highest dignities, having been made a member of the supreme council in 1625 and governor-general in 1636. He administered the government with much ability, and contributed much to the establishment of the Dutch commerce in India. Abel Tasman, whom he sent with a vessel to the South Seas in 1642, gave the name of *Van Diemen's Land* to a country long regarded as a part of New Holland, but since found to be an island, and now called *Tasmania;* he likewise discovered New Zealand. Another navigator, whom he sent out, made discoveries in the ocean north of Japan, which have been confirmed by voyages in our days. Van Diemen died in 1645.

DIEMEN'S (VAN) LAND. See TASMANIA.

DIEPPE, a seaport town, France, department Seine-Inférieure, on the English Channel, in a hollow between chalk hills, at the embouchure of the Arques, 33 miles N. Rouen, and 93 miles N.N.W. Paris. The houses, in general not lofty, are built of brick, many having balconies, and roofed with tiles; the streets are tolerably wide and regular. Almost the only public edifices worth special notice are the two Gothic churches, St. Jacques and St. Rémi. The former was begun in the thirteenth century, and though of unequal merit, is a fine building. St. Rémi's, founded in 1522, is built in the mixed Gotho-Saracenic. To the west of Dieppe proper is the suburb La Barre; and on the opposite side of the harbour La Pollet, which communicates with it by a stone bridge of seven arches, and is inhabited chiefly by sailors and fishermen. The port is spacious, and the depth of water in the basin sufficient for vessels of 1200 tons burden; but the entry to it is difficult. It is formed by two jetties, with several quays faced with masonry, and is defended by an old castle and a modern citadel. On the west jetty is a lighthouse 39 feet high. Dieppe is the chief watering-place of France, and is much frequented by visitors in summer, but still more towards autumn, during the recess of the legislature, and vacation of the colleges and government offices at Paris. The great bathing establishment, reconstructed in 1857, forms a luxurious retreat for bathers and invalids, and includes a ball-room, &c. The manufactures include works in ivory, the most famed in Europe; works in horn and bone, lace-making, sugar-refining, ship-building, &c. There is a busy fishery, especially for supplying Paris with mackerel, herring, &c.; and the oyster-beds in the locality are very extensive. The foreign trade of Dieppe, though much below that of Le Havre, is still considerable; and its port is much frequented by coasters. There is constant intercourse between this port and Brighton by steamers. Dieppe was the chief early port of France, and its inhabitants the most enterprising in foreign trade. Dieppe has frequently suffered from war. After the Norman Conquest it was a frequent subject of contest between the English and French kings. Philip Augustus pillaged and burned it in 1194, and in 1202 he took it from John. It was again subjected to the English by Henry V., revolted, and was besieged by Talbot in 1442. In 1694 it was bombarded by the English and Dutch fleet, and again in 1794 by the English. It was twice occupied by the Germans (9th and 14th December, 1870) during the Franco-German war. Pop. 19,946.

DIES FASTI ET NEFASTI, a Roman division of days, with reference to judicial business, into working-days and holidays. *Dies fastus* was a day on which courts could be held and judgments pronounced; *dies nefastus*, a day on which courts could not be held nor judgments pronounced. Assemblies of the people could be held only on the former. *Dies intercisi* were half-holidays. Morning and evening were *nefas;* the time between morning and evening sacrifice *fas*.

DIE-SINKING is the art of preparing dies for stamping coins, &c. The uses to which this art is applied are now much more numerous than formerly: besides buttons and medallions, ornamental work of various kinds, jewelry, fittings, &c., are struck from dies of various kinds. The following description of the process of die-sinking is abridged from Dr. Ure's Dictionary of Arts, &c. The first thing to be attended to in the manufacture of dies is the selection of the steel, which should be rather fine-grained than otherwise, and, above all things, perfectly even and uniform in its texture, and free from spots and patches finer or coarser than the general mass. The very fine and uniform steel with a silky fracture, which is so much esteemed for some of the purposes of cutlery, is unfit for the present purpose, from the extreme facility with which it acquires great hardness by pressure, and its liability to cracks and flaws. The very coarse-grained, or highly crystalline steel, is also equally objectionable. The best steel for the purpose is of a medium quality as to fineness of texture, not easily acted upon by dilute sulphuric acid, and exhibiting a uniform texture when its surface is washed over with a little aqua fortis, by which its freedom from pins of iron and other irregularities of composition is sufficiently indicated. The steel being selected, and properly forged at a high heat into the rough die, it is softened by very careful annealing, and in that state, having been smoothed externally, and brought to a table in the turning-lathe, it is delivered to the engraver.

The engraver usually commences his labours by working out the device with small steel tools in intaglio; he rarely begins in relief (though this is sometimes done); and having ultimately completed his design, and satisfied himself of its general effect and correctness by impressions in clay, and dabs, or casts in type-metal, the die is ready for the important operation of hardening, which, from various causes, is a process of much risk and difficulty, for, should any accident now occur, the labour of many months may be seriously injured, or even rendered quite useless.

If the die has been successfully hardened, and the protecting paste has done its duty by preserving the face from all injury and oxidizement, or burning, as it is usually called, it is now to be cleaned and polished, and in this state constitutes what is technically called a *matrix;* it may of course be used as a multiplier of medals, coins, or impressions, but it is not generally thus employed, for fear of accidents happening to it in the coining-press, and because the artist has seldom perfected his work upon it in this state. It is therefore resorted to for the purpose of finishing a *punch*, or steel impression for relief. For this purpose a proper block of steel is selected, of the same quality, and with the same precautions as before, and being carefully annealed or softened, is turned like the matrix, perfectly true and flat at the bottom, and obtusely conical at top. In this state its conical surface is carefully compressed by powerful and proper machinery upon the matrix, which, being very hard, soon allows it to receive the commencement of an impression; but in thus receiving the impression it becomes itself so hard by condensation of texture as to require during the operation to be repeatedly annealed or softened, otherwise it would split into small superficial fissures, or would injure the matrix; much practical skill is therefore required in taking this impression, and the punch at each annealing must be carefully protected so that the work may not be injured.

Thus, after repeated blows in the die-press, and frequent annealing, the impression from the matrix is at length perfected or brought completely up; and having been retouched by the engraver, is turned, hardened, and collared, like the matrix, of which it is now a complete impression in relief, and, as we have before said, is called a punch.

This punch becomes an inexhaustible parent of dies without further reference to the original matrix, for now, by impressing upon it plugs of soft steel, and by pursuing with them an exactly similar operation to that by which the punch itself was obtained, impressions are procured from it to any amount, which of course are fac-similes of the matrix.

DIES IRÆ, the original words of a Latin hymn describing the final judgment of the world. It is ascribed to Tommaso da Celano, a Minorite who lived in the thirteenth century. It was adopted into the liturgy of the church at some time previous to 1385. It is a beautiful poem belonging to those early Christian songs which combine the smoothness of rhyme with the gravity of Latin verse. This powerful poem makes a part of the requiem (the mass for the souls of the dead); and it is one of the highest and most difficult tasks for the composer to compose music adapted to the awful solemnity of the subject. Goethe has happily introduced a few stanzas of this poem in his Faust. As this hymn constitutes the chief part of the requiem, and is, at the same time, a fine example of a whole class of poetry little known in this Protestant country, we here quote it at length.

Dies iræ, dies illa,
Solvet sæclum in favilla,
Teste David cum Sibylla.

Quantus tremor est futurus,
Quando Judex est venturus,
Cuncta stricte discussurus!

Tuba mirum spargens sonum
Per sepulchra regionum,
Coget omnes ante thronum.

Mors stupebit, et natura,
Cum resurget creatura,
Judicanti responsura.

Liber scriptus proferetur,
In quo totum continetur,
Unde mundus judicetur.

Judex ergo cum sedebit,
Quidquid latet apparebit,
Nil inultum remanebit.

Quid sum miser tunc dicturus,
Quem patronum rogaturus,
Cum vix justus sit securus?

Rex tremendæ majestatis,
Qui salvandos salvas gratis,
Salva me, fons pietatis.

Recordare, Jesu pie,
Quod sum causa tuæ viæ,
Ne me perdas illa die.

Quærens me sedisti lassus,
Redemisti crucem passus,
Tantus labor non sit cassus.

Juste judex ultionis,
Donum fac remissionis,
Ante diem rationis.

Ingemisco tanquam reus,
Culpa rubet vultus meus·
Supplicanti parce, Deus.

Qui Mariam absolvisti
Et latronem exaudisti,
Mihi quoque spem dedisti.

Preces meæ non sunt dignæ
Sed tu bone, fac benigne,
Ne perenni cremer igne.

Inter oves locum præsta,
Et ab hædis me sequestra,
Statuens in parte dextra.

Confutatis maledictis,
Flammis acribus addictis,
Voca me cum benedictis.

Oro supplex, et acclinis,
Cor contritum quasi cinis,
Gere curam mei finis.

Lacrymosa dies illa
Qua resurget ex favilla,

Judicandus homo reus;
Huic ergo parce Deus.

Amen.

DIEST, a town, Belgium, province South Brabant, 32 miles E.N.E. Brussels, traversed by the Demer, which there forms several islands. The improvements which its fortifications have since 1838 received have made it a place of great strength. The church of St. Sulpitius is its only remarkable edifice. It has a college, several schools, and some benevolent institutions; several manufactures, that of hosiery of considerable extent; but the chief products of the place are beer and gin, the former being largely exported. Diest was once a feudal barony, of which the Princes of Orange were lords. The town was taken in 1705 by Marlborough; retaken the same year by the French, and dismantled. Pop. 7561.

DIET, GERMAN. See GERMANY and GERMAN CONFEDERATION.

DIETALIA ACTA, the records of the Hungarian diet, written in Latin, in which language the discussions of the diet used to take place. The discussions were not public, and the records were only given to members of the diet, and a few other persons through them.

DIET DRINK, an alterative decoction employed daily in considerable quantities, at least from a pint to a quart. The decoction of sarsaparilla and mezereon, the Lisbon diet drink, is the most common and most useful.

DIETETICS, in medical writings, is the due classification of food as respects the treatment and prevention of diseases. On a general survey of the several nations of the globe it has been observed that mankind enjoy health and strength when nourished upon the most opposite kinds of food, provided no great excess be committed in its quantity, and also that its quality be properly suited to the heat of the climate. Hence the natives of Hindustan, who feed entirely upon rice, and milk, and vegetables, are equally healthy with the Esquimaux and Laplanders, and other savages of the frozen regions of the globe, whose food consists entirely of the flesh of animals and fishes: and since Providence has ordained that fruit and vegetables should abound under the Torrid Zone, and denied them to the sterile rocks around the poles, we are taught by this natural distribution, as well as by our own experience, that cooling fruits and vegetables are best adapted to the heats of summer, and animal and stimulating food to the severe rigours of winter. The natives, therefore, of the more temperate regions are enabled to indulge in a greater variety of food, both animal and vegetable, and are in consequence endowed with greater bodily and mental powers, and the enjoyment of a longer period of life. In a state of health we need not draw many hair-breadth distinctions as to the superior salubrity of the several sorts of diet. Our greatest care should be to attend more to the quantity than the quality of our food, for upon that hinges the enjoyment of our health and spirits. It was the opinion of Dr. Fothergill that more persons die in England from *hard eating* than from *hard drinking*, and that excesses in the former were more dangerous than in the latter particular. And the poet has well expressed this by saying that

> 'The first physicians by debauch were made,
> Excess began, and sloth sustains the trade.'

There is no doubt that great moderation, both in eating and drinking, is one of the surest means of preserving health, as well as of assisting us to regain it when lost. Early habits of self-command, therefore, in the regulation of the appetite, are of the greatest importance to all who would enjoy good health and long life. And those persons who have been most remarkable for either have generally been contented with two moderate meals a day, which are certainly quite sufficient during a state of health. In this country the breakfast generally consists of tea, coffee, or cocoa, with a certain proportion of bread and butter. Those who indulge in field sports, or use violent exercise, may with saftey eat animal food and eggs in addition, but persons with delicate digestive powers, or who lead a sedentary life, cannot with safety or comfort eat animal food *constantly* to breakfast. Buttered toast, too, is very often pernicious to females with weak stomachs, and is frequently the cause of giddiness, indigestion, and sick headaches. Where tea disagrees, an infusion of the flowers of rosemary, sage, balm, and mint may be used instead. At dinner all made dishes highly spiced, such as curries, turtle-soup, &c., as provoking appetite, are hurtful; and the custom of late dining does harm, as it causes flushing of the face, indisposition to all exertion, great oppression, attended with quick pulse, dry clammy tongue, and burning of the palms of the hands, &c. New bread, too, cannot be eaten in any quantity with safety; and there have been instances of its having even occasioned death, while it is frequently the cause of heartburn and flatulence, without being at all suspected. The flesh of young animals seems to be more difficult of digestion than that of old; and the flesh of tame than that of wild animals. All sorts of fat meat, being more nutritious than lean, must be taken in smaller quantities. Hence, also, ham, bacon, and salted meats cannot be eaten in same quantities as the tender flesh of poultry. Fish may be considered as holding an intermediate station between animal and vegetable food; it has the advantage of being easily soluble, and when eaten without heating sauces or much butter is a healthy and agreeable food. It has been asserted, and apparently with good reason, that the use of much animal food blunts the sensibility and mental perceptions of those who indulge in it; and it is well known that Sir Isaac Newton, while engaged in composing his work on optics, found himself obliged to live entirely on vegetable food. Still it must be admitted that after a temperate meal of animal food the mind is fit for any degree of exertion. All boiled vegetables are in general easy of digestion; raw vegetables and salads are rather more difficult, but of course each individual must consult his own experience in such cases. Fruit, if perfectly ripe, is wholesome, but should be taken in the forenoon rather than after a hearty meal. As to drinks, Dr. Fothergill's rules are admirable: they are as follows: 1. The less quantity of fermented liquors we accustom ourselves to the better. 2. To abstain from spirits of all kinds as much as may be. 3. Where mild well-brewed beer agrees, to keep to it as a beverage. 4. Where water does not disagree, to value the privilege and continue it. But as it has been already said of solids, it is oftener the quantity than the quality which proves hurtful; and people, in the early part of their lives, cannot be too careful to guard against the first temptations to the love of wine or spirituous liquors. It should never be forgotten that excess in wine produces gout, apoplexy, palsy, and sudden death; and that the indulgence in spirits will predispose to cancer of the stomach, scirrhous liver, dropsy, and madness.

In all diseases attended with much fever or quickness of pulse the stomach loathes animal food, and there is generally a great increase of thirst, to quench which water either quite cold, or iced, or tepid, or rendered acid by the addition of orange or lemon juice, tamarinds, apples, currant jelly, cream of tartar, vinegar, &c., may be freely indulged in. Infusions, too, of barley, sage, balm, &c., may be taken. In chronic diseases attended with hectic fever, milk is the most proper diet, being at once nourishing and easily digested. The best food for infants is, of course, their mother's milk; but in general they may be weaned with advantage at five or six months, and whenever they begin to cut teeth it is proper to indulge them with a little animal food, such as soft-boiled eggs, beef-tea, and even chicken minced very fine. Many infants perish from having too much sugar given them in their food, which creates acidity in their bowels, and looseness, and even convulsions. When infants are affected with eruptions and cutaneous complaints, they may often be cured by giving them no sugar, and indulging them freely with gravy and salt. Gout, corpulency, and many other most distressing diseases may be entirely conquered by diet alone, independently of the use of medicine. In the cooking of animal food it is well to bear in mind that stewed and boiled meat are much more difficult to digest than meat cooked by fire alone.

DIETRICH, or DIETRICY, CHRISTIAN WILHELM ERNST, a famous German painter of the eighteenth century. He was born in 1712. His father was also a skilful painter, and instructed his son till he

was twelve years old, when he sent him to Dresden, and placed him under the care of Alexander Thiele. The picture of a peasant drinking, in the Dutch style, executed by Dietrich while a boy, is in the Royal Cabinet of Engravings at Dresden. He successfully imitated Raphael and Mieris, Correggio and Ostade. His paintings are scattered through almost all Europe. In the Dresden gallery, of which he was inspector, there are thirty-four of them. Some of his designs are in the Cabinet of Engravings in that place, and some in private collections. He died in 1774.

DIEU, or D'YEU (ancient *Insula Dei*), an island off the west coast of France, department of Vendée. It consists of one mass of granite, steep and inaccessible on the west side, but on the east so low as to furnish a tolerable harbour, which is defended by a fort and several batteries. It was occupied by the British, together with the Duc d'Artois, with a view to a descent on La Vendée, in 1795. The chief industry is sea-fishing. There are four lighthouses on the island, and it is distinguished by numerous Druidical monuments. Pop. 2929.

DIEU ET MON DROIT (French, signifying *God and my right*), the motto of the arms of England, first assumed by Richard I., to intimate that he did not hold his empire in vassalage of any mortal. It was revived by Edward III. when he claimed the crown of France. Except during the reigns of Elizabeth and Anne, who used the motto *Semper eadem*, and of William III., who used *Je maintiendray* as his own motto (*Dieu et mon droit* being retained on the great seal), it has ever since been the royal motto of England.

DIEULEFIT, a town, France, department of Drôme, in a valley inclosed by lofty hills, 18 miles east of Montélimar. It was once a stronghold of the Protestants, and its possession was often keenly contested. Its principal edifice is a handsome Protestant church with a model school attached, and it has several important manufactures. Pop. 4147.

DIEUZE, a town in the imperial territory of Elsass-Lothringen, German Empire (formerly department of Meurthe, France), 26 miles E.N.E. of Nancy. It is supposed to occupy the site of the Decem Pagi mentioned in Cæsar's Commentaries, and has a communal college. The inhabitants, 3104, are chiefly employed in the extensive coal-mines in the vicinity.

DIFFERENTIAL CALCULUS. See CALCULUS.

DIFFERENTIAL THERMOMETER, an instrument for determining the difference of temperatures between two points or places. That of Leslie is one of the best known, and will be found described under THERMOMETER. A pair of thermo-electric junctions (see THERMO-ELECTRICITY) is generally preferable to any other kind of differential thermometer. One of the junctions is put at one of the points, and the other junction at the other point, and a galvanometer is introduced in the usual way into the circuit, great care being taken to keep all the other junctions of whatever kind that occur in the arrangement strictly at the same temperature. The strength of the current generated, which is measured by means of the galvanometer, is, with the limitation that will be found explained under the article just alluded to, proportional to the difference of temperature between the two thermo-junctions; and with the assistance of a previous experiment at known temperatures on the thermo-junctions employed, the absolute difference of temperature between the two points at which the junctions are placed may be determined with great exactness.

DIFFRACTION. See INTERFERENCE OF WAVES OF LIGHT.

DIFFUSION OF GASES, or the intermixture of gases free to communicate with each other. When a jar of oxygen and a jar of hydrogen are connected together by a tube or opening of any kind, they rapidly become mixed; and their mixture does not depend on gravity, but takes place in opposition to that force, as may be shown by placing the jar of hydrogen gas above the other. Oxygen is sixteen times heavier than hydrogen, bulk for bulk, and, according to the laws of gravity, ought to *remain* below: but, instead of this, the heavier gas moves upwards and the lighter downwards, and the process of intermixture, or *diffusion*, goes on till the two gases are, as far as our present experiments can tell us, equably distributed through the whole space. After that they have no tendency whatever to separate. Graham made some experiments on the interdiffusion of gases, but further experiments are still wanting as to absolute rates of diffusion of various gases. The following law of diffusion may be stated, though not from experiment. In the case of a straight tube, of which the upper part is filled with one gas and the lower with another heavier gas to begin with, *the amount of diffusion is proportional to the square root of the time.* Thus, suppose a tube filled with oxygen below and hydrogen above at the beginning, and that after five minutes a certain percentage of oxygen is to be found a foot above the original line of demarkation, it will be four times five minutes, that is, twenty minutes, before the same percentage of oxygen is found 2 feet above the original line of demarkation, and forty-five minutes before that percentage is to be found 3 feet up. The diffusion of gases through porous separators was also studied by Graham. Two vessels, one containing oxygen and the other hydrogen, and connected by a tube which is stuffed with a plug of porous material, such as plaster of Paris, gradually diffuse one into the other through the porous plug. Or if a vessel filled with oxygen, and covered with a piece of moist bladder, be placed under a bell-jar filled with hydrogen, the oxygen will gradually diffuse out to the outside and the hydrogen will diffuse inwards, till finally there is sensibly an equable mixture of the gases inside and outside. But in these cases Graham found that the two gases do not pass through the porous separator at equal rates. In the case last supposed, the bladder that covers the oxygen jar will be seen to swell up rapidly, the hydrogen passing in much faster than the oxygen passes out. By properly arranged experiments Graham found that the rates of diffusion of gases through such a body as a plug of plaster of Paris are *inversely proportional to the square roots of the densities of the gases.* Thus in the case of two vessels, one containing hydrogen and the other oxygen, which is sixteen times as heavy, bulk for bulk, as hydrogen, the hydrogen will pass towards the oxygen jar four times as quickly as the oxygen will pass towards the hydrogen jar. The effect of the more rapid rate of diffusion of the less dense gas may be beautifully shown by the following experiment:—Let a glass tube 2 or 3 feet long be stopped with a plug of plaster of Paris at one end. Let it then be filled with hydrogen or with coal-gas, and let the open end of it be dipped under water contained in a saucer. The water will be seen to be sucked quickly up the tube, owing to the hydrogen or coal-gas escaping into the air more rapidly than the air can pass to the interior of the tube, a partial vacuum being thus formed. Gradually, however, the air will find its way in, and the water inside the tube will fall again to its original level. Advantage has been taken of this property to separate from each other two gases that are mixed, and one of which is much denser than the other. A mixture of oxygen and hydrogen

coming from the decomposition of water by a current of electricity may be separated by passing it along unbaked earthenware tubes, such as the stems of tobacco-pipes. The whole or nearly the whole of the hydrogen will escape through the sides of the piping to the outer air, and from the other end of the piping pure or nearly pure oxygen will be obtained.

DIFFUSION OF LIQUIDS. When two liquids that are capable of mixing, such as alcohol and water, are put in contact, they gradually diffuse one into the other in spite of the action of gravity. Thus the following experiment may be easily made, and will illustrate beautifully this very remarkable phenomenon. Let the lower half of a tall glass jar (a common tumbler will do) be filled with water, and the upper half with strong spirit, such as methylated spirit of wine or whisky. If this be done very carefully the spirit will be seen to float on the top of the water, and if the spirit be allowed to siphon from another vessel by means of a few threads of cotton wick, on to the top of the water, the two liquids may be obtained with a beautiful sharp line of separation between them, the spirit of course floating on the top. The spirit may conveniently be coloured with cochineal, or any other dye-stuff. Let the jar be now left undisturbed for some time, the top being covered with a glass plate cemented on with wax, so as to prevent evaporation of the spirit. In a day or two the sharp line of demarkation will be gone, some of the coloured spirit will evidently have *diffused* downwards, and some of the water upward. In a few weeks the process will have gone on farther, but it will be many months before it will be even tolerably complete, if the jar be left untouched and uninfluenced by variations of temperature, and a far longer time will elapse before the mixture will be nearly complete. There will be no real state of equilibrium till the two fluids are uniformly mixed throughout the whole space. At the same time, though the experiment we have here described will scarcely show it, there will be a very considerable shrinkage of the bulk of the liquids. This may be shown by using, instead of the tall jar described, a tube 3 or 4 feet long and half an inch in internal diameter. The tube having been filled with the two liquids, one on the top of the other, should be *hermetically* sealed; and as the process of diffusion goes on, the upper level of the liquids will be seen gradually to fall. In fact, a mixture of alcohol and water occupies less bulk than the two liquids do separately, as though the molecular interstices of one or both of the liquids were partially filled by the molecules of the other liquid.

When solutions of various solid bodies are placed in contact, inter-diffusion takes place also. Thus, if the experiment just described be tried with saturated solution of sulphate of zinc below and saturated solution of sulphate of copper (which is lighter) above, the blue of the sulphate of copper will be seen to creep gradually downwards, while the sulphate of zinc will be found by proper experiments to be creeping upwards. Graham made many experiments on the diffusion of liquids; but further experiments and determinations of absolute amounts of diffusion are much wanted. Graham also examined the phenomenon of diffusion of liquids and salts across porous membranes or *septa*, and founded on his discoveries a method of separation of *colloid* from *crystalloid* bodies, which he called *dialysis*. An account of the method is given under that name.

DIGAMMA, in the Greek language. In addition to the smooth and rough breathings, the ancient Greek language had another, which remained longest among the Æolians. This is most commonly called, from the appearance of the character used to denote it, which resembled our letter F, a *digamma*, that is, double Γ. It was a true consonant, and appears to have had the force of *f* or *v*. It was attached to several words, which, in the more familiar dialect, had the smooth or rough breathing. The whole doctrine, however, of the digamma, for want of literary monuments remaining from the period when it was most in use, is exceedingly obscure.

DIGBY, Sir Everard, an English gentleman, born of a Roman Catholic family in 1581. He enjoyed some consideration at the court of Elizabeth and James I., by whom he was knighted. Being gained over by Thomas Tresham to the extreme Catholic party, he was induced to give £1500 towards the expenses for the execution of the gunpowder plot. On the discovery of the conspiracy he was tried and hanged in 1606.

DIGBY, Sir Kenelm, the eldest son of the preceding, was born at Goathurst, in Buckinghamshire, in 1606. He was educated in the Protestant religion, and entered at Gloucester Hall, Oxford. On his return from his travels he brought back with him a recipe for making a sympathetic powder for the cure of wounds, being much addicted to the philosophy which employed itself in alchemy and occult qualities. On the accession of Charles I. he was created a gentleman of the bed-chamber, a commissioner of the navy, and a governor of the Trinity House. He soon after fitted out a small squadron at his own expense to cruise against the Algerines and Venetians, and obtained some advantages over the shipping of both these powers. He returned with a great increase of reputation, and having a good address and a graceful elocution, with a fine person and an imposing manner, he made a considerable figure. On a visit to France he was converted to the Catholic religion. On the breaking out of the civil war he was committed prisoner to Winchester House, where he amused himself by writing observations on the Religio Medici of Sir Thomas Browne, and on the ninth canto of the Fairy Queen, in which Spenser has introduced some mysterious matter in regard to numbers. Being liberated, he passed into France, and visited Descartes. In 1646 he printed at Paris his own philosophical system, in two works, entitled a Treatise on the Nature of Bodies, and a Treatise on the Nature and Operation of the Soul. In 1651 he also published Institutionum Peripateticarum libri quinque, cum Appendice Theologica de Origine Mundi. All these treatises are written in the spirit of the corpuscular philosophy, which they support with more learning and ingenuity than solidity or force. After the ruin of the royal cause he returned to England to compound for his estate, but was not allowed to remain. He resided in the south of France in 1656 and 1657, and produced at Montpellier a Discourse on the Cure of Wounds by Sympathy. On the Restoration he returned to England, became a member of the Royal Society, and was much visited by men of science. He married a lady who was more distinguished for her beauty than her virtue. Of this lady, Venetia Digby, a great many pictures and busts are extant; but she died while still young. Sir Kenelm died in 1665, at the age of sixty-two.

DIGEST. See Civil Law.

DIGESTER, an instrument invented by M. Papin. It consists of a strong vessel of copper or iron, with a cover adapted to screw on, with pieces of felt or pasteboard interposed. A valve with a small aperture is made in the cover, the stopper of which valve may be more or less loaded, either by actual weights, or by pressure from an apparatus on the principle of the steelyard. The purpose of this instrument is to prevent the loss of heat by evaporation. Water may be thus heated to 400° Fahr.; at which temperature

its solvent power is greatly increased. A particular modification of this was made by Chevreul.

DIGESTION is that process in the animal body by which the aliments are dissolved, and the nutritive parts are separated from those which cannot afford nourishment to the body. The organs effecting this process are divided into the *digestive* organs, properly so called, and the *auxiliary* organs. The former are composed of the divisions of the intestinal canal, which includes the stomach, the great and small intestines, &c. To the latter belong the liver, the pancreas, and the spleen. The first process of digestion is the solution of the aliments. When the aliments, after being properly prepared, and mixed with saliva by mastication, have reached the stomach, they are intimately united with a liquid substance called the *gastric juice*, by the motion of the stomach. By this motion the aliments are mechanically separated into their smallest parts, penetrated by the gastric juice, and transformed into a uniform pulpy or fluid mass. At the same time a solution of the aliments into their simple elements, and a mixture of them so as to form other products, takes place, effected partly by the peculiar power of the stomach and the liquid generated in it, partly by the warmth of this organ. This pulpy mass, called *chyme* (which see), proceeds from the stomach, through the pylorus, into the part of the intestinal canal called the small intestine, where it is mixed with the pancreatic juice and the bile. Both these liquids operate most powerfully on the chyme, yet in very different ways. The mild juice of the pancreas attracts the milk-like liquid of the chyme, and forms with it the *chyle*, which is absorbed by the capillary vessels called *lacteals*. On the other hand, the bitter matter called *bile*, formed by the liver from the blood, attracts the coarser parts, which are not fitted to be absorbed into the fine animal organization, and excites the intestinal canal to the motion which carries it off. For further information on the subject of digestion, particularly of diseased digestion, see the article DYSPEPSIA.

Digestion, with chemists and apothecaries, the maceration of any substance which is to be softened or dissolved, commonly pulverized, in a solvent liquid. It is inclosed in a tight vessel, and exposed to a gentle heat for a longer or shorter time. By this process essences, elixirs, and tinctures are made.

DIGGING, among miners, the operation of freeing ore from the stratum in which it lies, where every stroke of their tools turns to account; in contradistinction to the openings made in search of such ore, which are called *hatches*, or *essay-hatches*, and the operation itself, *tracing of mines*, or *hatching*.

DIGIT, in arithmetic, signifies any one of the ten numerals, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. The word comes from *digitus*, a finger; thus indicating the humble means originally employed in computations. Digit is also a measure equal to ¾ inch.

Digit, in astronomy, is the measure by which we estimate the quantity of an eclipse. The diameter of the sun or moon's disk is conceived to be divided into twelve equal parts, called *digits;* and according to the number of those parts or digits which are obscured, so many digits are said to be eclipsed. When the luminary is wholly covered the digits eclipsed are precisely twelve; and when it is more than covered, as is frequently the case in lunar eclipses, then more than twelve digits are said to be eclipsed.

DIGITALIN. According to the most recent researches three substances can be got from *Digitalis purpurea*. One, *digitalin* proper, forms fine white silky needles, of a perfectly neutral reaction, sparingly soluble in water and alcohol, insoluble in ether, soluble in all proportions in chloroform. It is also soluble in acids. Its taste is persistently bitter, and it has no smell. It is an energetic poison acting like foxglove, but more powerfully. The second substance, which is also poisonous, is called *digitaleïn*. It is a bitter, colourless, amorphous body, quite soluble in water. The third has not received a distinguishing name, but is called the *inert* substance. It forms fine brilliant white needles, which have no taste and odour, are sparingly soluble in water and chloroform, but dissolve readily in hot alcohol. The nature and relations of these bodies are not yet thoroughly understood. Digitalin, prepared by various processes, and probably not chemically pure, is employed in medicine.

DIGITALIS, a genus of plants of the natural order Scrophulariaceæ, including the purple foxglove (*D. purpurea*), which possesses important medicinal properties, and inhabits the temperate and southern parts of Europe, and is frequently cultivated for ornament in America. The plant when fresh possesses a bitter, nauseous taste, and is violently emetic and cathartic. When prepared and administered medicinally, it has the remarkable property of diminishing the strength and frequency of the pulse, and is at the same time diuretic.

DIGITIGRADA, according to Cuvier's arrangement, the second tribe of the Carnivora, so called from their walking on the ends of their toes, as distinguished from the Plantigrada, which, like the bear, places the whole foot upon the ground. This tribe includes the genera *Mustela* or weasel, *Canis* or dog, and *Felis* or cat.

DIGNE (ancient, *Dinia*), a town, France, capital of the department of Basses-Alpes, picturesquely situated on a mountain slope, 60 miles north-east of Marseilles; pop. 7002. It is the see of a bishop, and possesses a communal college and a theological seminary. The staple manufactures are articles in leather, and the trade is chiefly in dried fruits, especially prunes and pistachio nuts. In the vicinity, in the picturesque valley of the Bléone, are thermal saline springs, which have a temperature of 104°, and are efficacious in cutaneous affections, paralysis, &c.

DIJON (ancient, *Dibio*), a town, France, capital of the department Côte-d'Or, on the railway from Paris to Lyons, in a fertile plain, at the foot of a range of vine-clad slopes near the confluence of the Ouche and its tributary torrent the Suzon. It is of an oval form, and is surrounded by a lofty wall, with five gates. The ramparts are finely planted, and furnish beautiful promenades. The most of the streets are regular and spacious, and lined by handsome houses and fine hotels of hewn freestone. Many of the buildings belong to the period when Dijon was capital of the dukedom of Burgundy, and are remarkable for the massiveness and solidity of their construction. The chief public edifices are the cathedral of St. Benigne, a building of vast extent, with little architectural beauty, and a lofty wooden spire above 300 feet high; the church of Notre Dame, in the purest Gothic, and remarkable alike for the delicacy of its ornaments, the beauty of its portal, and the boldness of its construction; the church of St. Michael, with two richly-decorated towers surmounted by octagonal cupolas, and with a portal on which Sambin has lavished all the ornaments which his luxuriant imagination could devise; the ancient palace of the dukes of Burgundy, at a later period the Palais des États, and now used partly as the hôtel de ville, partly as a museum, which is rich in monuments of the middle ages, and a library containing 70,000 printed volumes, and from 800 to 900 MSS.; and the theatre. The palais de justice or court-house was formerly the parliament house of Burgundy. The botanical garden, founded in 1722, and the cemetery on the Paris road, are objects deserving of notice.

Dijon is the seat of a bishop and of various courts, and is well provided with establishments both benevolent and educational. The manufactures of the place chiefly consist of cloths, hosiery, blankets, wax-candles, mustard, vinegar, chemical products, paper-hangings, &c. There are also tanneries, foundries, machine factories, distilleries, numerous establishments for the manufacture of the celebrated Liqueur de Cassis, worsted, cotton, and oil mills. The local traffic is considerable, particularly in the wines of Burgundy, the trade in which is concentrated here. The immediate environs are very attractive, including a public park and ornamental grounds; while a few miles to the north-west the Val de Suzon opens into several glens of romantic beauty. Many eminent men were natives of Dijon, including the celebrated Bossuet, Crébillon, Saumaise (Salmasius, the antagonist of Milton), Piron, Rameau, &c. Dijon is a very ancient city, and is believed to be of Roman foundation. The annals of the middle ages give constant evidence of its importance in early times, as the capital of the dukedom of Burgundy, the rival of ancient France in extent of territory, and occasionally its superior in power. After the death of its last independent duke (Charles the Bold, slain in 1477), his Burgundian possessions having merged into the French dominions, the comparative importance of Dijon immediately sank. Pop. 39,193.

DIKE, or Dyke (connected with *dig, ditch;* Fr. *digue;* Dutch, *dijk*), a ditch or drain, and also a work of stone, timber, or fascines, raised to oppose the passage of the waters of the sea, a lake, river, or the like. In no country has the art of building dikes and taking care of them been carried to so much perfection as in Holland. Their immense importance may be conceived from the fact that in 1287, 80,000 persons lost their lives by the destruction of the dikes, and in the fifteenth century 100,000 perished. At present the construction and repair of the dikes are carried out in a most systematic manner and at immense cost. Embankments are made toward the sea with heavy timbers, filled in with stone, and the surface is covered with bundles of flags and reeds fastened down by stakes. Piles are also driven into the sand and protected by earth, turf, and stones. These dikes are often raised 40 feet above ordinary high water, and are wide enough at top for a common roadway or canal, sometimes both. Frequently the slopes are covered with wicker-work made of willow twigs, and this tree is extensively cultivated to furnish these supplies, as also to bind together by its roots the loose sands. Walls of masonry are built in the most exposed situations, and piles placed outside to break the force of the waves. One of the most gigantic of the structures is the Helder Dike, about 6 miles in length, and 40 feet broad at top, along which is a good road. The annual cost of keeping this dike in repair is between £6000 and £7000.—In geology the term is applied to intrusions of igneous rock which fill up veins and fissures in the stratified systems.

DILAPIDATION is where an incumbent of a church living suffers the parsonage-house or outhouses to fall down, or be in decay for want of necessary repairs; or it is the pulling down or destroying any of the houses or buildings belonging to a spiritual living, or destroying of the woods, trees, &c., appertaining to the same; it is said to extend to committing or suffering any wilful waste in or upon the inheritance of the church. An action for dilapidation may be brought by the successor against the predecessor or his executors in the spiritual court by the common law, or in the courts of common law.

DILEMMA (from Gr. *dis*, twice, and *lēmma*, an assumption), in logic, an argument in which the same conclusion may be drawn from two contrary propositions. A person is said to be in a dilemma, or on the horns of a dilemma, when each of several courses of action would lead to an unsatisfactory result. We append one of the most famous of the classical dilemmas. A young rhetorician said to an old Sophist: 'Instruct me in pleading and I shall pay you when I gain a cause.' The master sued for the reward, and the scholar eluded the claim by a dilemma. 'If I gain my cause I shall not pay you, because the award of the judge shall be against you. If I lose it I may withhold it, as I shall not have gained a cause.' The master replied: 'If you gain you must pay me, because you promised to pay me when you gained a cause; if you lose you must pay me, because the judge will award it.' When the case came before the judges they were unable to decide it.

DILETTANTE, an Italian expression, signifying a lover of the arts and sciences, who devotes his leisure to them as a means of amusement and gratification. The term was originally applied to a lover of Italian vocal music, and was at one time the name of a party which upheld the superiority of that class of music. In 1734 a number of gentlemen founded a Dilettanti Society in London, with the object of combining social intercourse with the cultivation of artistic knowledge. On the rapid accumulation of the funds, the members resolved, in 1764, to send out an expedition to collect details and drawings of the most remarkable artistic monuments of antiquity. Messrs. Chandler and Revett accordingly were sent to Asia Minor, and returned with the materials for the splendid work on Ionian Antiquities, published at the expense of the society, the first volume of which was issued in 1769: a second volume was published in 1797, and a third in 1840. Among other works published by the society are Specimens of Ancient Sculpture, Ægyptian, Etruscan, Greek and Roman (two vols. imp. folio; London, 1809, 1835); the Unedited Antiquities of Attica (imp. folio; London, 1817); the Temples of Ægina and Bassæ, by C. R. Cockerell (folio; London, 1860).

DILL (*Anethum graveolens*, Linn.), a hardy biennial plant, a native of Spain, and introduced into Britain in 1590. The plant grows upright, and resembles fennel, only is smaller. It has a single, slender stem, and leaves finely divided or pinnatifid. The flowers, which form an umbel, appear in June or July. The seed is of an oval form, convex on one side, flat on the other, having three striæ on the outside, and surrounded with a small membranous border. Its taste is slightly acrid, and its odour stronger but less pleasant than fennel seed. The whole plant is strongly aromatic. The leaves are used in certain pickles, as cucumber, and to give flavour to soups and sauces. It is also occasionally used in medicine. It is easily raised from seed, which should be sown in February, March, or April, or in autumn.

DILLENIUS, Johann Jakob, a botanist, born in 1687, at Darmstadt, and distinguished for his investigations into the propagation of plants, particularly cryptogamous plants. In compliance with the invitation of a rich botanist, William Sherard, in 1721, he went to England, where he spent part of his time in London, and part at his friend's country seat, in Eltham. Here he published several works, and particularly that splendid production which appeared in 1732, Hortus Elthamensis, in which the drawings, prepared by himself, are distinguished by the greatest faithfulness. His last work, on the mosses (Historia Muscorum), added much to his reputation. He was visited by Linnæus in 1736, and the great Swede was so impressed with his host's knowledge that he adopted implicitly some of his faulty views in opposition to his own better judg-

ment. Sherard founded a professorship of botany in the University of Oxford, for his friend, who died there in 1747.

DILLINGEN, a town, Bavaria, circle of Swabia, 24 miles north-west of Augsburg; pop. 5391. It is pleasantly situated on the left bank of the Danube, here crossed by a bridge; is surrounded by dilapidated walls, contains four churches, and was long the seat of a Jesuit university, which was abolished in 1802. Its buildings are now used as a lyceum. The old castle was formerly the ordinary residence of the Bishop of Augsburg. The manufactures consist of wollen and linen cloth, paper, &c.; and there is a considerable trade in the fruit and hops extensively grown in the vicinity.

DILMAN, a town, Persia, province of Azerbijan, 75 miles west of Tabreez, and 30 miles s.s.w. of Khoi, in the large and fertile valley of Selmas. It is a new town, there being an old one of the same name, now almost in ruins, about 4 miles west from it. It is of considerable extent, and is surrounded by gardens. The bazaars are poor and ill supplied, but the streets are clean. Pop. estimated at 15,000.

DILUENTS, in medicine, are those substances which increase the proportion of fluid in the blood. They consist of water and watery liquors.

DILUVIUM, the name formerly given by geologists to certain gravels and comparatively recent deposits, which seem to have been the result of a rush of water or *deluge*. It is distinguished from *alluvium*, which is a deposit of smaller stones and fine sand washed down by rivers in their ordinary state.

DIME (French, *dîme*, contraction of *dixième*, a tenth), the term for the tenth part of a dollar in the United States of America. By the act passed 21st Feb. 1853 its standard weight is fixed at 38·4 grains of silver of the fineness of nine parts pure metal to one part of alloy.

DIMINUENDO (Italian), in music, signifies that the playing or singing passage over which it is placed must be gradually softened down in loudness of tone.

DIMINUTIVE, in grammar (from the Latin *diminutivum*), an affix, which conveys the idea of littleness, and all other ideas connected with this, as tenderness, affection, contempt, &c. The opposite of *diminutive* is *augmentative*. In Latin, diminutives almost always ended in *lus*, *la*, or *lum*; as *Tulliola*, *meum corculum*, little Tullia, my dear or little heart. This syllable was sometimes preceded by another one, not belonging to the original word; as *homunculus*. A few words formed their diminutives in other ways.

The Italian is particularly rich in diminutives and augmentatives: *ino*, *etto*, *ello*, convey the idea of smallness, dearness, &c.; *one*, of largeness; *uccio*, sometimes of smallness, with reproach, but often without it: *accio* signifies that the thing is disgusting, unpleasing, &c.; for example, *casa* is a house; *casetta*, *casina*, *casella*, a small house, nice little house; *casone*, a large house; *casuccia*, a small, insignificant house; *casaccia*, an ugly house. That expressive tongue can compound two or three of these endearing affixes; and the writer has frequently heard little Italian children form almost endless words, as if overflowing with tenderness; for instance, *fratellinucciettinetto*. Adjectives also can receive the diminutive termination; as *carino*, *carinuccio*, from *caro*. In Spanish there are similar diminutives, augmentatives, and other affixes. Thus from *hombre*, a man, are formed the augmentatives *hombron*, *hombrazo*, *hombronazo*, *hombrachon*; and from *muger*, a woman, *mugerona*, *mugeraza*, *mugeronaza*. The Spanish diminutives are these: from *hombre*, a man, *hombrecito*, *hombrecico*, *hombrecillo*, *hombrezuelo*; from *muger*, a woman, *mugercita*, *mugercica*, *mugercilla*, *mugerzuela*; from *chico*, small, *chiquito*, *chiquillo*, *chicuelo*, *chiquituelo*. Diminutives in *ito* and *ico* usually denote endearment or tenderness, as those in *illo* do sometimes; those in *elo* always denote contempt; from *libro*, a book, are formed *librillo*, *librito*, *librico*, *librete*, *libruelo*, *librejo*. In Portuguese the diminutives and augmentatives correspond to those of the Spanish language, as from *cabra*, a goat, *cabrito*; *mosca*, a fly, *mosquito*; *homem*, a man, *homemzinho*; *irmao*, a brother, *irmaozinho*. In French there are many diminutives formed from other words; as, *tablette*, of *table*, *charette* of *char*; but there is no general affix which can be added to every substantive. The German has the syllables *chen* (in Low German, *ken*, with which corresponds the English *kin*, as in *manikin*, and some other words), *lein* and *el*, for substantives; *lich*, &c., for adjectives; *lich* corresponds to the English *ish* or *like*; for instance, *rundlich*, roundish or roundlike (from *rund*, round); and *eln* is substituted for the final *en*, and the root vowel of the word generally modified, for verbs, as from *bitten* (to pray), they form *betteln* (to beg, the action of a beggar), *klingeln* from *klingen*, to sound. The German even adds the diminutive to pronouns, and nurses sometimes will say *duchen*, from *du*, thou.

The English language affords examples of diminutives, but has no affix which can be used at pleasure to convey this idea. Among English diminutives are—

In *el*, { *cockerel*, a little cock; *kernel*, a little corn; *pickerel*, a little pike.

kin, { *manikin*, a little man; *lambkin*, a little lamb; *napkin*, from *nappe*, French for *table-cloth*; *pipkin*, a little pipe.

ling, { *chickling*, a little chick; *gosling*, a little goose; *darling*, that is, *dearling*, or little dear; *witling*, a person of small understanding.

et, { *bracelet*, from *bras*, French for *arm*; *pocket*, from *poke*, a bag or pouch; *tablet*, a little table.

Diminutives of proper names are also formed, in colloquial and familiar language, by adding *y* or *ie* to the names, as *Charley*, *Johnny*, &c.

DIMITY, a stout cotton fabric, ornamented in the loom either by raised stripes or fancy figures; stripes are the most common, as the mounting of the loom is much simpler and the texture can be produced at less expense. It is rarely dyed, but usually employed white, as for bed and bed-room furniture.

DIMORPHISM is crystallization of a body in forms belonging to two different systems, or in incompatible forms of the same system. At the end of last century, when the constant composition of bodies was beginning to be relied upon, it was thought reasonable to assume that if a body were always similarly constituted it would have similar properties, and crystallize in the same way, and, accordingly, those who made crystalline form a basis of classification, separated the minerals, calc-spar and arragonite. Some chemists, however, observed that certain bodies crystallographically different were identical in composition, and among the rest the two just mentioned, so that the advocates of a chemical classification ranged them together. It had indeed been suggested that arragonite, which apparently was only calcic carbonate, might contain carbonate of strontian, just as that substance called strontianite sometimes contains carbonate of calcium, and the expectation had been repeated, so that when Stromeyer announced in 1819 that he had found strontia in arragonite, the difference of form was believed to be explained. In 1821, however, Mitscherlich satisfactorily proved, in the case of the acid phosphate of sodium, that it could assume two essentially different forms, though both belonged to the trimetric system, and

subsequently that sulphur crystallized in two different systems, and other examples left no doubt of the fact of dimorphism. Since that time it has been shown that the form a dimorphous body assumes depends upon temperature, which was proved by Rose for calc-spar and arragonite, and which has been thought conclusive, since arragonite certainly does not necessarily contain strontia. Quite recently, however, it has by experiment been shown that the difference can be produced by the presence of various salts in solution, and the following results are very curious. A cold pure solution of calcic carbonate crystallized in the fundamental form, but if an alkaline silicate were present, the fundamental form was modified. Again, the solution mixed with traces of carbonate or nitrate of lead, or sulphate of calcium, gave crystals partly in the fundamental, partly in the arragonite form, and if mixed with strontic carbonate, crystals of arragonite only were obtained. From this it appears that the form of the crystal is influenced by other bodies in solution, which appear to be able to impress the crystal with their own characters; the form is also affected by the solvent from which it separates.

Elements which crystallize in two forms are carbon, sulphur, phosphorus, arsenic, antimony, bismuth, copper, palladium, iridium; and dimorphous compounds are chloride of ammonium, iodide of potassium, iodide of mercury, oxide of lead, suboxide of copper, oxide of titanium, arsenious and antimonious oxides, the two forms of which are isomorphous with one another, and in the same way carbonate of calcium and carbonate of iron, potassic nitrate, some sulphates, seleniates, and other salts. Sulphate of nickel can crystallize in three forms, and it is therefore trimorphous.

DINAJPUR, a town, Hindustan, Bengal, capital of a district of same name, on a branch of the Attri, 205 miles north of Calcutta; population estimated at 30,000. It consists of four distinct parts with a square in the centre, surrounded by shops, and with the exception of the European residences and offices, which are large and commodious, though without architectural merit, is almost a mere assemblage of huts. The district covers an area of about 3820 square miles, and has a population estimated at 1,200,000, of whom about two-thirds are Mohammedans and one-third Hindus. The surface is undulating, but in no part attains a greater elevation than 100 feet. The soil is of a light ash colour. Rice and indigo are the principal crops. The climate is extremely variable, and at particular seasons very unhealthy.

DINAN (ancient, *Dinnanum*), a town, France, department of Côtes-du-Nord, on the Rance, 34 miles east by south of St. Brieuc. It stands on a steep hill nearly 200 feet above the river, is surrounded by high old walls, pierced with four large gates, and outwardly has an imposing look, but the interior is by no means prepossessing. The ancient boulevards, planted and partly laid out as gardens, afford agreeable walks. Among the public buildings the principal are the churches of St. Sauveur and St. Malo, and the Tour de l'Horloge, a lofty erection of granite. The manufactures consist of sail-cloth, linen, cotton, and woollen goods, nails, leather, sugar, and salt. Being situated at the embouchure of the Rance, and at the head of the Ille-et-Rance Canal, the town has a considerable inland and coasting trade. Its port can admit vessels of 150 tons burden. Dinan sustained frequent sieges during the middle ages. Pop. 7898.

DINANT, a town, Belgium, in the province and 14 miles s. of Namur; pop. 7208. It is picturesquely situated on the Meuse, a little below the junction of the Lesse, and is hemmed in by precipitous limestone rocks, one of which is crowned by the citadel. It was fortified as early as the twelfth century, and deemed impregnable. In 1466 Philip the Good, duke of Burgundy, besieged it with formidable artillery and 50,000 men; and having taken it by assault, razed it to the ground, and threw 800 of its inhabitants, tied in pairs, back to back, into the Meuse. It was rebuilt in 1493. The town may be said to consist of but one street, which follows the tortuous course of the river; and has preserved much of its medieval appearance. The principal edifices are a Gothic church and a town-house, once the palace of the princes of Liége. It has paper-mills, tanneries, breweries, salt refineries, and other manufacturing establishments, and is famous for its gingerbread, composed of rye-flour and honey. There are marble quarries in the vicinity, and the environs are very picturesque.

DINAPUR, a town, Hindustan, province Bahar, on the right bank of the Ganges, about 12 miles north-west of Patna. It is one of the great stations of the British army in India, and has very extensive barracks, with cantonments capable of accommodating about 6000 troops. The environs are studded with handsome bungalows, but the town, extending above a mile along the river, is a mere assemblage of thatched huts. Pop. about 20,000.

DINAS BRICKS are highly valued on account of their refractoriness or infusibility, in which property they are superior to Stourbridge fire-clay bricks. They are made of a peculiar rock, containing 98 per cent. of silica, with a little alumina, which occurs in the vale of Neath, in Glamorganshire. The rock is crushed, moistened with water, and moulded by a machine. An imitation is made in Austria from a quartz rock, which is very carefully examined to see that no fusible matter, and especially iron, is present. The quartz, after being heated for some hours, is washed, and then pounded under a hammer. The ground quartz is afterwards thoroughly mixed with a carefully prepared clay moulded, subjected to very great pressure, dried, burned by a heat gradually increased, to whiteness. The kiln is then closed, the fires being withdrawn, and the bricks, after three days' time, are removed.

DINGLE, a seaport, Ireland, county Kerry, on a slope above the north shore of the bay of same name, 188 miles south-west of Dublin; pop. 2251. In early times it was much frequented by the Spaniards, who came to fish in the bay, and it is said that many both of the inhabitants and their houses bespeak a Spanish origin. The whole town has rather a pleasing appearance, and is much frequented for sea-bathing. The harbour admits only small vessels, and during westerly winds is not reached without danger. Many disastrous shipwrecks have taken place in the bay; but its fisheries are valuable. The trade is chiefly in corn and butter sent to Liverpool.

DINGLER, Johann Gottfried, was born at Zweibrücken, January 2, 1778. He was at first an apothecary at Augsburg, then a chemical manufacturer and proprietor of a print-work. From 1806 to 1820 he conducted journals for calico-printing, dyeing, and bleaching, and in 1820 began the well-known periodical called after him Dingler's Polytechnical Journal, which he at first edited himself, and latterly assisted by his son, and which, at the time of his death, had reached the 140th vol. He died at Augsburg, May 19, 1855, having retired from business ten years earlier. The journal still continues, and upwards of 200 vols. have appeared.

DINGO, the native dog of Australia (*Canis Dingo*, Blum.; *Canis Australasiæ*, Desmarest; *Canis familiaris*, var. *Dingo* of others), was probably introduced by man in very remote times, as it undoubtedly has been introduced by him into New Zealand. It is

yellow above, white below; the ears are sharp, the snout slender, and the tail long, hairy, and pendulous. The New Zealand variety is smaller and of a dirty yellow colour. In both countries it is now a mongrel breed, the pure stock being almost abolished. M'Coy found it along with the kangaroo and kangaroo rat beneath the lava flows of Mount Macedon, but remote as is the period thus indicated, there is no reason for denying on that account the possibility of its having been introduced by man at a period when the continent was either connected with some of the Pacific Islands by continuous land, or was so near some land since submerged that its importation was easy. The fact of its having been the only placental mammal in this continent renders its indigenous character doubtful. In its proportions it resembles the dhole, from which, however, the difference of dentition separates it. Though ferocious, it has been domesticated to some extent by the natives, and presents a curious transition between the wild and the tame state, being from time to time obliged to desert its master in quest of food, returning, however, after a time. It breeds with European dogs in Australia, but is sterile in captivity.

DINGWALL, a royal and parliamentary burgh, seaport, market town, and county town of the united shires of Ross and Cromarty, in the south-east of Ross-shire, at the head of Cromarty Firth, 11 miles N.N.W. Inverness, at the foot of Strathpeffer. The town, erected into a royal burgh in 1227, consists of a main street running east and west, and a few smaller streets branching off from it, lighted with gas and adorned with rows of poplar-trees. It has a parish and a Free church and an Episcopal chapel, a well-attended parochial school, a town-house, an antique edifice with a spire; a commodious new prison, and handsome county buildings. A limited trade is carried on, chiefly in exporting corn, timber, bark, and other products of the country, and importing lime, coals, and general merchandise, for the supply of the surrounding districts. Close to the town is a small harbour, admitting vessels drawing 9 feet water. Dingwall unites with Tain, Cromarty, Dornoch, Wick, and Kirkwall in returning a member to Parliament. Pop. 2125.

DINKELSBÜHL, a town, Bavaria, Middle Franconia, capital of the district of the same name, on three hills, above the right bank of the Wernitz, 44 miles south-west of Nürnberg. It is surrounded with walls, is the seat of a law court, contains a handsome parish and several other churches, a Latin school, orphan asylum, and two hospitals; and has important manufactures of woollen hosiery, coarse linen, straw hats, paper, and stone slabs for tables, a dyework, brewery, and several mills. It suffered much during the Thirty Years' war. Pop. 5213.

DINORNIS, a name given by Professor Owen to a genus of large wingless birds—classed among the Struthionidæ or ostrich tribe—the fossil bones of various species of which have been found in New Zealand. These birds had bones devoid of air-passages, were three-toed, and some of them must have been of immense size. The *D. gigantens*, for example, is estimated to have been at least between nine and ten feet high, and some would make it as much as thirteen or fourteen feet. The skeleton of the *D. elephantopus* again is described by Owen as 'the most massive of any in the whole class of birds —its toe-bones almost rival those of the elephant.' These birds are spoken of by the natives as 'Moas,' and from the condition of the skeletons found, as well as from native legends, there is little doubt that they were exterminated in comparatively recent times, being hunted for the sake of their flesh. Their bones have been found in considerable numbers as well as their eggs, and it would appear that the latter were sometimes buried with the dead by way of provision for them on their journey to the other world.

DINOTHERIUM. A miocene genus of proboscidean mammals, distinguished from the elephant in having a large tusk directed downwards from the lower jaw on either side of the middle line. While in these two genera the tusks are found only in one jaw, the mastodon had tusks in both jaws. See PROBOSCIDEA.

DIOCESE (Greek, *dioikēsis*, administration), an ecclesiastical division in the Christian church; in the Catholic Church, a territory over which the jurisdiction of an archbishop or bishop extends. With the Protestants in Germany a diocese signifies all the parishes which are under the inspection of one superintendent. This arrangement is derived from the times of the Emperor Constantine (fourth century A.D.), who made Christianity the religion of the state. In the Episcopal Protestant countries diocese signifies the jurisdiction of a bishop. Thus, in England, the province of Canterbury contains twenty dioceses, and the province of York six; each diocese is divided into archdeaconries, each archdeaconry into rural deaneries, and each deanery into parishes.

DIOCLETIAN (C. VALERIUS DIOCLETIANUS, surnamed *Jovius*) was a man of mean birth, a native of Dalmatia. He was proclaimed emperor by the army, 284 A.D. He was successful against his enemies, defeated Carinus in Mœsia (286), conquered the Allemanni, and was generally beloved for the goodness of his disposition. But new troubles and attacks disturbed the Roman Empire, and compelled him to share the burden of government with colleagues; at first, with M. Aurel. Valerius Maximian (286), an ambitious, rude, and cruel soldier, who defeated the Gauls. Diocletian, at the same time, was successful against the Persians in the East, and afterwards penetrated to the sources of the Danube, in Germany. He subsequently, in 292, named C. Galerius, Cæsar, and Maximian raised Constantius Chlorus to the same dignity. Thus the empire was divided into four parts. Diocletian recovered Egypt, and as long as he preserved his influence the unanimity continued; but he resigned the imperial dignity at Nicomedia (305), as did Maximian at Milan at the same time. Diocletian retired to Salona in Dalmatia, where he found happiness in the cultivation of his garden, and lived in tranquillity until the year 313. In the latter part of his reign he was induced to sanction a persecution of the Christians, whom he had long protected. He founded the absolute power, which was more firmly established by the family of Constantine.

DIODATI, GIOVANNI, an eminent divine, was born at Lucca, about the year 1576, of a noble Catholic family; but, embracing the Protestant faith early in life, he removed to Geneva, where he made such progress in his studies, that, at the age of 21, he was appointed professor of Hebrew in that city. Some time afterwards he was made professor of theology, and in 1619 was deputed with his colleague, Theodore Tronchin, to represent the Genevan clergy at the Synod of Dort; and his abilities were so much respected by that synod, that he was one of the six ministers appointed to draw up the Belgic confession of faith, which was intended to confine the professors of the reformed religion in Holland within the pale of pure and unadulterated Calvinism. Diodati is most celebrated for a translation of the Bible into Italian, faithful and elegant, but perhaps too paraphrastical; and Father Simon maintains that his notes are rather the serious meditations of a divine, than the judicious reflections of a critic. He also trans-

lated the Bible into French, but is not thought to have succeeded so well in this as in the Italian. He was the first translator into French of Father Paul's History of the Council of Trent, which is faithful, but not very elegant. Diodati died in 1649 at Geneva.

DIODORUS OF ARGYRIUM, in Sicily, and therefore called *Siculus;* a celebrated historian in the time of Julius Cæsar and Augustus. In order to render his history as complete and exact as possible, he travelled through a great part of Europe and Asia. It is very much to be regretted that the greater part of this history, which the author called the Historical Library, in the composition of which he combined the ornaments of rhetoric with the detail of facts, after the example of Theopompus and Ephorus, and on which he had bestowed the labour of thirty years, has not reached our times. It consisted of forty books, and comprised the history of almost all nations. It is written in the style of annals, and the events are narrated in a confused and discordant manner; but the work is valuable as containing a great mass of materials collected from a number of writers whose works have perished. Only the books 1—5 and 11—20, and a number of fragments, are now extant. Among the best editions are those of Wesseling and Eichstadt, with Heyne's commentary (Bipont and Strasburg, 1793–1807, eleven vols.), and Dindorf's in 1829.

DIŒCIOUS, in botany, plants which have their stamens on one individual and their pistils on another. The willow, the yew, the poplar, &c., are diœcious.

DIOGENES OF APOLLONIA (a town in Crete), known also as the *Physicist*, an early Greek philosopher, who belonged to the Ionian school of philosophy. He considered air as the element of all things. He lived at Athens in the fifth century B.C.

DIOGENES OF SINOPE (a city of Pontus in Asia Minor) was born about 412 B.C., and was the most famous of the Cynic philosophers. (See CYNICS.) Having been banished from his native place with his father, who had been accused of coining false money, he went to Athens, and requested Antisthenes to admit him among his disciples. That philosopher in vain attempted to repel the importunate supplicant, even by blows, and finally granted his request. Diogenes devoted himself, with the greatest diligence, to the lessons of his master, whose doctrines he extended still further. He not only, like Antisthenes, despised all philosophical speculations, and opposed the corrupt morals of his time, but also carried the application of his doctrines, in his own person, to the extreme. The stern austerity of Antisthenes was repulsive; but Diogenes exposed the follies of his contemporaries with wit and good humour, and was, therefore, better adapted to be the censor and instructor of the people, though he really accomplished little in the way of reforming them. At the same time he applied, in its fullest extent, his principle of divesting himself of all superfluities. He taught that a wise man, in order to be happy, must endeavour to preserve himself independent of fortune, of men, and of himself: in order to do this, he must despise riches, power, honour, arts, and sciences, and all the enjoyments of life. He endeavoured to exhibit, in his own person, a model of Cynic virtue. For this purpose he subjected himself to the severest trials, and disregarded all the forms of polite society. He often struggled to overcome his appetite, or satisfied it with the coarsest food; practised the most rigid temperance, even at feasts, in the midst of the greatest abundance, and did not even consider it beneath his dignity to ask alms. By day he walked through the streets of Athens barefoot, without any coat, with a long beard, a stick in his hand, and a wallet on his shoulders; by night he slept in a tub, though this has been doubted. He defied the inclemency of the weather, and bore the scoffs and insults of the people with the greatest equanimity. Seeing a boy draw water with his hand, he threw away his wooden goblet as an unnecessary utensil. He never spared the follies of men, but openly and loudly inveighed against vice and corruption, attacking them with satire and irony. The people, and even the higher classes, heard him with pleasure, and tried their wit upon him. When he made them feel his superiority, they often had recourse to abuse, by which, however, he was little moved. He rebuked them for expressions and actions which violated decency and modesty, and therefore it is not credible that he was guilty of the excesses with which his enemies had reproached him. His rudeness offended the laws of good-breeding rather than the principles of morality. Many anecdotes, however, related of this singular person are mere fictions. On a voyage to the island of Ægina he fell into the hands of pirates, who sold him as a slave to the Corinthian Xeniades in Crete. The latter emancipated him, and intrusted him with the education of his children. He attended to the duties of his new employment with the greatest care, commonly living in summer at Corinth, and in winter at Athens. It was at the former place that Alexander found him on the roadside basking in the sun, and, astonished at the indifference with which the ragged beggar regarded him, entered into conversation with him, and finally gave him permission to ask for a boon. 'I ask nothing,' answered the philosopher, 'but that thou wouldst get out of my sunshine.' Surprised at this proof of content, the king is said to have exclaimed, 'Were I not Alexander, I would be Diogenes.' At another time he was carrying a lantern through the streets of Athens in the daytime: on being asked what he was looking for, he answered, 'I am seeking a man.' Thinking he had found in the Spartans the greatest capacity for becoming such men as he wished, he said, 'Men I have found nowhere; but children, at least, I have seen at Lacedæmon.' We are told that Socrates once remarked to him, 'I see your vanity through the holes of your coat;' but chronology will not admit of the truth of this anecdote. He died 323 B.C., at a great age. When he felt death approaching, he seated himself on the road leading to Olympia, where he died with philosophical calmness, in the presence of a great number of people, who were collected around him.

DIOGENES LAERTIUS, the author of a sort of history of philosophy, appears to have been born at Laerte, in Cilicia, and to have lived towards the close of the second century after Christ; but no certain information exists either as to his life, studies, or age. The work is divided into ten books, and bears in MSS. the title, On the Lives, Doctrines, and Apothegms of those who have distinguished themselves in Philosophy. From some allusions in it, it appears to have been written for a lady of rank, who occupied herself with the study of philosophy, especially that of Plato. He begins with an introduction on the origin and early history of philosophy. He considers the Grecian philosophy not as an importation but as indigenous, and he divides it into two schools: the Ionic, commencing with Anaximander, ending with Clitomachus, Chrysippus, and Theophrastus, of which the Socratic school forms a part; and the Italian, founded by Pythagoras, and whose last great teacher was Epicurus. This school includes in its comprehensive embrace Heraclitus, the Eleatics, and the Stoics. The book is full of absurd and improbable anecdotes, and is characterized by much confusion and careless

mistakes, yet as containing a mine of information regarding the private life of the Greeks, and many fragments of works now lost, it is of considerable value. It was long the foundation of most modern histories of philosophy, and has preserved the names and doctrines of numerous writers, of whom but for it little would have been known. The best modern editions are those of Hübner (Leipzig, 1829), and Cobet (Paris, 1850).

DIOMEDES.—1. A king of the Bistones, who fed his horses on human flesh, and used to throw all strangers who entered his territories to those animals to be devoured. He was killed by Hercules, who carried off the horses.

2. One of the heroes at the siege of Troy, the son of Tydeus and Deïpyle, and King of Argos. He early lost his father, who was slain before Thebes, took part in the second expedition to Thebes, and became one of the suitors of Helen. After she was carried off the Grecian chiefs resolved on an expedition to Troy, to avenge this outrage against Greece, and Diomedes engaged in the expedition at the head of the Argives, Tirynthians, and several other nations. His daring courage rendered him one of the most distinguished heroes, and, according to the testimony of Nestor, superior to all his contemporaries. Protected by Pallas, he not only encountered the most valiant of the enemies, many of whom he killed, but even ventured to attack the immortals. When Aphrodite hastened to the rescue of her son Æneas, whom he was on the point of putting to death, he wounded the goddess in her hand with his spear, and would have torn Æneas from her arms but for the interference of Apollo. He thrice assailed even Apollo himself, nor did he desist till terrified by the threats of the god. Animated by Pallas he then turned his arms against Ares (Mars), wounded him in the belly, and compelled him to return to Olympus. He was equally distinguished in the council. He boldly opposed the proposal of Agamemnon to leave the plains of Troy without having gained the object of the expedition, and prevailed; he even adhered to his opinion after Achilles had rejected the proffered reconciliation. By carrying off the horses of Rhœsus from the enemies' tents he fulfilled one of the conditions on which alone Troy could be conquered. With Ulysses he removed Philoctetes, who had the arrows of Hercules, from Lemnos, which was another condition of the fall of Troy. Finally, he was one of the heroes who were concealed in the wooden horse by whom the capture of Troy was at length accomplished. Though he reached home in safety, the vengeance of Aphrodite awaited him. During his absence that goddess had inspired his wife, Ægiale, with a criminal passion for Cometes; and Diomedes, on his arrival, was compelled to leave Argos, and promise never to return, under pain of death. Accompanied by his most faithful friends, he set sail for Italy. Of his residence there the accounts are contradictory: some say that he died there at a great age; others, that he was slain by King Daunus; others, that he suddenly disappeared.

DION OF SYRACUSE lived in the times of the Elder and the Younger Dionysius, tyrants of Syracuse. He was related to them, and long exercised great influence over them. He attempted to reform the tyrannical disposition of the younger Dionysius by the precepts of philosophy, but his enemies succeeded in rendering him suspected by the king, and in effecting his banishment. Dion went over to Greece, where the beauty of his person, the excellent qualities of his mind and heart, and his lavish expenditure, gained him so many friends that he resolved to employ force to deliver his country from a prince who had closed his ears to remonstrances. With this design he embarked with 800 valiant warriors, landed in Sicily, and hearing that Dionysius had set out a few days before for Italy, hastened to Syracuse, and entered the city amidst the acclamations of the people. After some ineffectual attempts to recover his authority Dionysius was at length obliged to abandon the crown, and fled with his treasures to Italy. Dion was also soon after obliged to leave the city, on account of the people favouring the policy of his chief opponent, Heracleides, whose politics were more of a democratic cast than Dion's. New troubles having broken out in Syracuse, he was recalled; but sullied his triumph by the execution of his rival, and numerous other arbitrary acts. Discontent soon spread even to his own immediate followers, one of whom, Callippus of Athens, encouraged by his increased unpopularity, formed a conspiracy against him, and succeeding in gaining over some of his Zacynthian guards, caused him to be assassinated in his own house B.C. 353. There can be little doubt but that Dion, who possessed the intimate friendship of Plato, was at the outset of his career animated by noble sentiments; but he was of a harsh and unyielding disposition, qualities which would easily degenerate into despotism when he found himself at the head of affairs. His life has been written by Plutarch and Cornelius Nepos.

DIONÆA MUSCIPULA, Venus' fly-trap, a plant of the sun-dew order or Droseraceæ, and found in North American marshes. It exhibits in a remarkable degree the irritability common to some plants. There are three hairs upon each division of the leaf, which are so sensitive that an insect alighting upon one of them causes the two sides of the leaf suddenly to come together with considerable force, the strong bristles of the marginal fringe crossing each other like the teeth of a steel trap, so as to retain the intruder, whose struggles to escape only increase the pressure of the leaf-trap. The plant is cultivated in conservatories in this country.

DION CASSIUS COCCEIANUS, a celebrated writer, was born about 155 A.D. at Nicæa, in Bithynia, was carefully educated, and after accompanying his father to Cilicia, of which he held the administration, came to Rome about 180, and obtained the rank of a Roman senator. During the reign of Commodus he held no public office, but devoted himself to pleading in the courts of justice and to the collection of materials for the history of that emperor. This work was afterwards incorporated in his History of Rome. On the accession of Pertinax he was appointed prætor, and entertained hopes of still greater preferment from his successor, Septimius Severus, but was disappointed. In the reign of Caracalla Dion was one of the senators whom it had become customary to select to accompany the emperor in his expeditions, and he complains bitterly both of the great expense to which he was thus subjected, and the grievance of being obliged not only to witness the disgraceful proceedings of the tyrant, but to be an apparent accomplice in them. In 219 he was raised to the consulship, and about 224 became proconsul of Africa. In 229 he was again appointed consul; but beginning to feel his life precarious under Alexander Severus, he asked and obtained permission to return to his native town of Nicæa, and there spend the remainder of his life in retirement. The period of his death is unknown. His writings are very numerous, and with the exception of one on dreams and prodigies, in which he betrays much credulity, and at the same time a good deal of the spirit of a courtier, are all historical. The most important of all is a History of Rome, written in Greek and divided into eighty books, from the arrival of Æneas in Italy and the foundation of Alba and Rome to A.D. 229. Unfortunately only a small part of it is extant, but that part increases the regret

for the loss of the remainder; for though the style is harsh and heavy, full of barbarisms and without any attempt at elegance, the materials are in general accurate, and imply a thorough knowledge of the subject. In imitation of Thucydides, he endeavours to give a philosophical cast to his narrative, but it must be confessed he is far inferior to his model. Among the best editions of his works is that of Sturz, commenced in 1824 and completed in 1843, in nine vols. 8vo, Leipzig.

DION CHRYSOSTOM. See CHRYSOSTOM.

DIONE, the mother of Aphrodite (Venus), who therefore bears the surname of *Dionæa*, or is called by this name alone.

DIONYSIA, the same as *Bacchanalia*, from Dionysos or Bacchus. See BACCHUS.

DIONYSIUS OF HALICARNASSUS, in Caria, a learned critic and teacher of eloquence, went to Rome about 30 B.C., where, for the instruction of his countrymen, he wrote his Roman Antiquities, in twenty books, in which he relates the early history of Rome and its government up to the times of the first Punic war. We have the first nine books of this work entire, the tenth and eleventh nearly so, and some fragments of the others. His residence in Rome during twenty-two years, his intercourse with the most learned Romans, and his knowledge of the ancient annalists, render him very important to the critical historian, though he has given his own colouring to the Roman traditions. Dionysius is also valuable as a critical and rhetorical writer. It is difficult to pronounce, however, on the genuineness of the writings attributed to him in this department, without a critical examination. The Rhetoric (Schott, Leipzig, 1804), for instance, belongs only in part to Dionysius, and probably received its present form in the third century A.D.

DIONYSIUS THE AREOPAGITE (that is, one of the judges of the Areopagus, at Athens), converted to Christianity by the Apostle Paul about the middle of the first century, and first bishop at Athens, where he suffered martyrdom, is remarkable for the Greek works which have been ascribed to him, and for being considered the patron saint of France. These writings, composed in an obscure style, and hardly intelligible on account of their mysticism, are: Of the Heavenly Hierarchy; Of the Names of God; Of the Ecclesiastical Hierarchy; and Of the Mystic Theology; with a number of letters, which by their style, contents, and historical allusions, betray an author who could not have lived before the middle of the fourth century. They appeared, in a very equivocal manner, as the works of Dionysius, as late as the sixth century. Fantastic descriptions of the Deity, and of the orders of angels and blessed spirits, borrowed from the New Platonic philosophy; brilliant representations of the Catholic ceremonies; exaltations of the hierarchy; praises of the monastic life, and mystic interpretations of the doctrines of the church, gave them such charms that the absurdities in which they abound did not prevent the ignorant clergy of the seventh century from reading them with delight, and finding in them the clearest proofs of the apostolic origin of many ecclesiastical observances and institutions, which, though of a much later date, they implicitly believed to be genuine. In France, where a certain Dionysius (See DENIS, ST.) established the first Christian community at Paris in the third century, they were readily received in the ninth century; and this Dionysius, without further inquiry, was taken for the Areopagite, because the origin of the Gallican Church could thus be carried back to the first century; and France gained a patron who was a martyr and the immediate disciple of an apostle. The monastic life in the Western Church gained new support from these writings, which were frequently translated into Latin; and mystic theology received its first impulse from them. The convent of St. Denis, which was originally dedicated to the first apostle of Christianity at Paris, but is now consecrated to Dionysius the Areopagite, had a remarkable dispute with the convent of St. Emmeran, at Ratisbon, in the eleventh century, concerning the possession of the genuine bones of the saint. Each maintained that it possessed his earthly remains. Ratisbon had its claims erroneously confirmed by the infallible authority of the pope. In the fourteenth century another church in Paris claimed the third head of the saint. The writings attributed to Dionysius the Areopagite are as spurious as the relics. The pretended author of them neither left such writings, nor ever taught in France, as was put beyond all doubt by the French critics Daille, Sirmond, and Launoi.

DIONYSIUS THE ELDER raised himself from a low condition to the rank of general, and afterwards to that of tyrant (that is, absolute ruler) of Syracuse, about 406 B.C. The Agrigentines, who had escaped when Agrigentum was taken by the Carthaginians, accused the Syracusan generals of treachery. Dionysius supported their complaints, and contrived that the enraged people should choose other leaders, of whom he was one. He soon found means to render his colleagues suspected also, and to have himself appointed commander-in-chief. In this post it was no difficult task for him, by the assistance of the troops, whom he had drawn over to his interest, to make himself master of the citadel of Syracuse, together with all the arms and provisions contained in it, and finally to declare himself tyrant, at the age of twenty-five years. The more firmly to establish his power, he married the daughter of Hermocrates, whose family was the most distinguished in Syracuse. After having finished a short war against the Carthaginians, and successfully quelled several seditions, in which he reduced some other cities on the island under his authority, he made preparations for a great war against Carthage. The fortune of arms, which, in the beginning, had favoured him, soon turned against him, and the Carthaginians had already laid siege to Syracuse, when the plague made great ravages among them. Dionysius, having just received a reinforcement of thirty ships, took advantage of the discouraged state of the enemies, attacked them at once by land and water, and gained a complete victory, which was soon followed by an advantageous peace. In his expeditions into Lower Italy he reduced the city of Rhegium by famine (387). After another short war with Carthage he lived some time in peace, occupied with making verses, and imagining himself, in spite of the poorness of his productions, as great a luminary in the poetical as in the political world. Nay, he even ventured to contend for the prize in the Olympic games, and sent for that purpose a solemn embassy, accompanied by a number of the best declaimers, to read his poems; but, with all their art, they were not able to prevent the tents of Dionysius from being torn down and plundered by the multitude. A second embassy, which he sent four years afterwards, was received still more unfavourably. In 368 he commenced a new war against the Carthaginians, intending to drive them entirely out of Sicily. He did not, however, succeed in this attempt, and was obliged to conclude a disadvantageous peace. For this misfortune he was indemnified by the success of one of his tragedies at Athens. The news of this event filled him with such immoderate joy that he fell sick. At the instigation of his son the physicians administered to him a potion which caused his death (B.C. 367). He holds the

unenviable place in ancient history as the representative tyrant. He lived in continual dread of assassination, of which the sword of Damocles has become the symbol. He had the state prison so constructed that even the solitary murmurings of its inmates could be heard by him, and it was hence called the Ear of Dionysius.

DIONYSIUS THE LITTLE (so called on account of his short stature), a Scythian monk, who was abbot of a monastery at Rome in the beginning of the sixth century, and died about the year 530, according to others about 545, celebrated as the author of the computation of time from the Christian era. He calculated an Easter cycle in 526, and fixed the birth of Christ, agreeably to the most certain data, in the year 753 after the foundation of Rome. The computation of time from the birth of Christ thus established, and now universal among Christians, was not publicly used until the eighth century.

DIONYSIUS THE YOUNGER succeeded his father, Dionysius the Elder. For the purpose of recalling him from the excesses to which he was addicted, Dion (see DION) directed his attention to the doctrines of Plato, representing to him that this great philosopher alone was able to teach him the art of government, and the means of rendering his subjects happy. In consequence of this advice Dionysius invited Plato to his court. The latter, complying with his urgent invitations, succeeded in tempting him into the path of virtue and knowledge, and in giving a new character to his whole court. An opposite party, however, headed by the historian Philistus, awakened the king's suspicions against Dion, and caused his banishment. Plato in vain endeavoured to effect his recall, and after having been long retained by force, finally left Syracuse himself, when Dionysius was engaged in a war in another part of the island. After the restoration of peace, Plato, at the repeated request of the king, returned to his court, and again endeavoured, though in vain, to effect Dion's recall. He therefore insisted upon his own dismissal. Dionysius at last appeased him by promising to restore Dion his fortune, on condition that he would undertake nothing against the throne. But he violated his promise, and Plato, after experiencing many mortifications, finally left him. Dion then appeared and made himself master of the city of Syracuse, to which Dionysius did not return until after the murder of Dion. His misfortunes, however, had no other effect than to render him more cruel. The first families of the city fled from his tyranny. Meantime the Carthaginians commenced a new war with Syracuse, and entered into a secret union with Hicetas, whose intention it was to make himself master of the city. He, however, disguised his purpose, and even approved of the measure of calling upon Corinth for assistance. Timoleon appeared with a fleet before Syracuse, and expelled not only the enemies, but also the tyrant. Dionysius, who had surrendered himself, was carried to Corinth, where he is said to have gained a scanty living by giving lessons in grammar, or as one of the attendants on the rites of Cybele, and to have died in the contempt which he had brought upon himself by his excesses.

DIOPHANTUS OF ALEXANDRIA, the first Greek writer on algebra, flourished, according to some authorities, about the middle of the fourth century, according to others about the end of the sixth. We first meet with his name in a life of Johannes Damascenus written by John of Jerusalem in the eighth century. He left behind him thirteen books of Arithmetical Questions, of which only six are extant; and a work on Polygon Numbers. The Diophantine Analysis is that branch of algebra which treats of indeterminate questions, of which the following are examples:—1. To find two whole numbers the sum of whose squares is a square. 2. To find three commensurable numbers such that the sum of the squares of two of them shall be equal to the square of the third.

DIOPSIDE, a variety of augite or pyroxene crystallizing in oblique prisms. It is a silicate of calcium and magnesium, sometimes with traces of iron and manganese. A colourless transparent variety called alalite, from Ala in Piedmont, is free from iron, and is sometimes used as a gem, but it is generally of a pale-green tint. Its specific gravity is 3·31; it is barely able to scratch glass; fuses when heated, but is insoluble in acids. It has been found in Finland, the Tyrol, Silesia, &c. It has also been observed in slag from a furnace, and it has been made by heating a mixture of lime and magnesia to redness, and when in this state passing chloride of silicon over the oxides.

DIOPTASE. This very rare mineral, found as yet only in Siberia and Nassau, is a hydrated silicate of copper. It has an emerald-green colour, is transparent and vitreous, and has a specific gravity of 3·27—3·34. It crystallizes in the hexagonal system. When heated it fuses, and becomes black or red, and is gelatinized by hydrochloric acid. Its greatly inferior hardness and higher specific gravity distinguish it from the emerald.

DIOPTRICS, the science which treats of the refraction of the rays of light, or the laws of vision when the rays, before reaching the eye, pass through different refracting mediums—for instance, from the air through the glasses of a telescope. Dioptrics, consequently, is a branch of optics, that is, the science of vision in general. It demonstrates the different directions in which the rays move, according as they are broken on plane or curved surfaces. The principles deduced from these observations determine the nature of the various lenses, explain the manner in which the light is refracted in the human eye, teach the manner of seeing through lenses, and the composition of them, consequently the theory of telescopes, magnifying-glasses, &c. The ancients were not acquainted with this science. Natural science, in modern times, has been greatly indebted to it. By its aid, or rather by the aid of the glasses which it has taught how to construct, the human eye has been enabled to reach objects previously unknown. Kepler, Snellius of Leyden, Descartes, Newton, &c., not only extended this science, but founded a great part of their discoveries on it. In modern times the science of dioptrics has been very much enriched by the important invention of the achromatic telescope. See REFRACTION, TELESCOPE, LENS.

DIORAMA, a very beautiful mode of depicting landscape scenery, invented or perfected by M. Daguerre, and first exhibited by him in 1823. The particular advantage which this mode of representing the face of nature possesses over any other yet invented is that it causes the light to play at will all over the picture so that the spectator can hardly help imagining himself placed on the very spot when he perceives the rays of the sun now lighting up one range of mountains, now another, and beholds them peeping out from behind masses of clouds, which gradually become overcast as if with rain, and then the lowering effect giving way in its turn to bright gleams of sunshine, which enlighten the bosoms of the distant lakes, glitter upon the purling brooks, and then die away behind the darker skirts of the surrounding woods and thickets.

All this is produced by a mode of uniting transparent painting to the usual opaque method, and causing the light to fall upon the picture both from

before and behind.. At the same time, by means of coloured transparent blinds, suspended both above and behind the picture, and which are put in motion by machinery, the rays of light can be intercepted and made to fall at pleasure in graduated tints upon every part of the picture in succession.

DIOSCORIDES, PEDANIUS, born at Anazarbus (Cæsarea Augusta), in Cilicia, in the first century of the Christian era, a Greek physician, author of a celebrated work on *materia medica*, in five books. It is particularly valuable in regard to botany, as most of the medicines which the author mentions are taken from the vegetable kingdom. Two other works are also attributed to him—the Alexipharmaca, which was united with the Materia Medica, forming the three last books of it, and treating of the poisons in the three kingdoms of nature, and their antidotes; and the Euporista, which treats of remedies that are easily procured. The best edition of Dioscorides is that of Sprengel (two vols. Leipzig, 1829–30).

DIOSCURI. See CASTOR AND POLLUX.

DIOSPYROS. See EBONY.

DIP of the horizon is an allowance made in all astronomical observations of altitude for the height of the eye above the level of the sea.

DIP, a term used in geology to express the direction of mineral strata relatively to the cardinal points towards which they point. Thus a stratum rising towards the east and inclining towards the west is said to *dip* in the former direction and to *crop out* in the latter. The degree of inclination or amount of the dip is determined by the angle which a line drawn perpendicular to the direction of the stratum makes with the horizon, and as the determination of this angle is always of more or less importance in all geological descriptions, an instrument has been invented which furnishes an easy means of measuring it.

DIPHTHERIA (Greek, *diphthera*, skin), a malignant disease of the throat, characterized by the exudation of a thick leathery membrane in the throat, and allied to croup and quinsy, with which last it is often confounded. It has only recently attracted public attention by its frequency and peculiar symptoms. It is a specific and most fatal disease. It is always accompanied by a very low state of the system, indicating the necessity of giving stimulating nourishment very freely. The most essential thing in its treatment is to keep up the strength, and apply antiseptic agents to the exudation on the throat with a view to its destruction. It is most common in the close and crowded districts of large cities, and is attributed to the action of putrid effluvia on the fauces, especially the foul air of sewers and cess-pools.

DIPHTHONG, derived from two Greek words meaning *twice* or *double sounding*, is a grammatical term not easily defined with strict accuracy and precision, but sufficiently described by the dictionary of the French Academy as a syllable in which the sound of two vowels is pronounced by one impulse of the voice. In written language both the vowels which form the diphthong are usually expressed, as in the common instances of *au* and *ei* in Greek, but in English the long vowel *i*, as in *pine*, though written only as one letter, is evidently a diphthong; and on the other hand, two letters written as a diphthong have only the sound of a simple vowel, as *ea* and *ie* in the words *breadth* and *friend*. In this case the combined vowels form what is called an improper diphthong.

DIPHYODONT, a term applied to those animals which develop two sets of teeth, a deciduous or milk set, and a permanent set. This is the case in the majority of mammals, though the amount of replacement may vary: thus in man twenty teeth of the adult are preceded by a milk set; in the hare, the anterior incisors are not so preceded, but the posterior smaller incisors replace an earlier pair, so that while the very young and the adult have four incisors, at an intermediate period, before this replacement has been completed, six may be present. Of the monophyodonts, in which only a single series of teeth is developed, the sloths are a good example.

DIPLOMA (from the Greek *diploō*, I fold up), literally a letter folded but once, and therefore divided into two parts. It is used to signify a document signed and sealed in which certain rights, privileges, dignities, &c., are conferred. Thus a letter or writing of a university conferring a degree is called a *diploma*.

DIPLOMACY. The precise time at which the word *diplomacy* began to be applied to the management of the mutual relations of independent states through accredited agents cannot be easily ascertained, but the Cardinal de Richelieu is generally considered as the founder of that regular and uninterrupted intercourse between governments which exists at present between almost all the Christian powers. However, the instructions given by Machiavelli to one of his friends, who was sent by the Florentine Republic to Charles V. (Charles I. of Spain) show that Richelieu was not the first person who conceived all the advantages that might be derived to a government from the correspondence of an intelligent agent accredited at the seat of a foreign government. It is probable that from the beginning the duties of diplomatic agents were at least as great as at present, as far as the *art* of diplomacy alone was concerned. To study the character of the prince and the disposition of his ministers; to observe with a vigilant eye the passing events; to investigate the strong and weak points of a state; to establish relations which might become useful, either in peace or in war; to strengthen the existing amicable relations, and to weaken the means of attack and of defence on the part of the foreign state; to extend commercial intercourse in a manner profitable to the country of the ambassador; to protect the subjects of the ambassador's sovereign, and to give a great idea of his power and resources by all possible means;—such were, as we see from the instructions given by Machiavelli to his friend, the cardinal points recommended to a diplomatic agent early in the sixteenth century; and they will, with few alterations, serve to guide ambassadors, ministers, and *chargés d'affaires* yet in the womb of time. Still there are differences, produced by the progress of civilization and the improvement of public morals, that must be noticed. Thus intrigue, falsehood, and murder were sometimes resorted to by the earliest diplomatists, and contributed to render diplomacy, in the eyes of the undiscriminating, almost a by-word of reproach. War was the sole umpire of right. Except in the Germanic Confederacy, law was hardly ever brought to bear upon international relations. It was not till the independence of Holland, and the subsequent development of maritime power, that political questions were examined by the learned, in consequence, probably, of having become connected with great public grievances and judicial investigations. From that time, and chiefly from the conclusion of the Treaty of Westphalia—the most remarkable epoch in the history of international intercourse—diplomacy assumed a more legitimate, a higher and really useful character. From that time the display of wealth, fascinating and prepossessing manners, an unblemished character, discretion, knowledge of mankind, natural parts, nay, upright intentions and noble views, ceased to be sufficient for the fulfilment of duties so much enlarged by the improving condition of general society, through the advancement and diffusion of

knowledge. Even more than this is now required, and to be a perfect diplomatist at the present day a man should be a sound lawyer, well acquainted with the municipal laws of more than one country, versed in the sciences, from which industry and arts derive their splendour and a state its strength, and equal to any of the tasks to which those with whom he is brought into contact might put his learning and sagacity.

Diplomatic agents are of several degrees: 1, ambassadors; 2, envoys extraordinary and ministers plenipotentiary; 3, ministers resident; 4, *chargés d'affaires;* 5, secretaries of legation and *attachés.* Their rank was regulated in Europe, in the above order, by the congress assembled at Vienna in 1814; and many such quarrels as formerly arose from questions of precedence are now obviated by the agreement of the European powers, that among ministers of the same rank he who arrives first shall have the precedence over his colleagues.

The most ancient relics of diplomatic correspondence, perhaps, which have been preserved, are those in the Excerpta Legationum, vol. i., of the Byzantine historians, or the fifty-third book of the great historical compilation made by order of the Emperor Constantine Porphyrogenitus. Among them will be found the Relation of an Embassy sent by the Emperor Theodosius the Younger to Attila, in the year 449. The account here given of court ceremonies, international courtesies, personal pretensions of diplomatists, and the means by which, in barbarous ages, and at the court of a half-savage prince, political ends were pursued, remarkably illustrates the truth of the old proverb, 'There is nothing new under the sun.' (See Marten, Précis du Droit des Gens Modernes de l'Europe; new edition, Paris, 1857; Manuel Diplomatique de Charles Martens, 1822.)

DIPNOI. This remarkable order of fishes derives its interest from its forming a group nearly intermediate between the fishes and amphibians. It includes only the mud-fishes (*Lepidosiren*), found in the rivers of Eastern and Western Africa and of Eastern America, in the waters of these continents to which the living equivalents of the ganoid fishes of the older strata are restricted. The *Lepidosiren* or *Protopterus* is eel-like in shape, the body is covered with rounded scales, and tapers posteriorly, a continuous fin running along half the dorsal and a small part of the ventral margin. The pectoral and ventral fins are long pointed ribbon-like organs. The skeleton consists of a cartilaginous skull, in which bones are developed, but to a less extent than in the ordinary bony fishes; and a spinal column, which is cartilaginous throughout. The ends of the bony ribs, of the bony arches which roof in the spinal canal, and of the similar arches which cover in a canal for blood-vessels on the under surface of the caudal region are connected to the cartilaginous column in the same way as these structures are associated in the oldest ganoids, as of the Old Red Sandstone series. The continuous median fin is supported by fin rays, and the pectoral and ventral limbs likewise consist of fin rays, which are borne on a central jointed cartilaginous rod. The adult possesses internal and rudimentary external gills. The intestine has a spiral valve, as in the sharks and ganoids, and opens into a cloaca. So far the structure is piscine. The resemblance to the amphibians consists in the opening of the nostrils into the mouth by apertures within the lips, in the possession of two firm-walled air-sacs or lungs, which occupy the dorsal part of the body cavity for the greater part of its length, and open by an aperture on the lower aspect of the œsophagus. Lastly, the heart has a right and a small left auricle and a ventricle: the left auricle receiving the aerated blood from the lungs. The combination of respiratory organs is similar to that which is presented by the tailed amphibians with persistent gills (perennibranchiate), as the axolotl. This interesting group is allied to the ganoids through the Ceratodus of Queensland, in which the air-sacs are partially respiratory, the auricles of the heart imperfectly divided, and the roof of the mouth provided with more complex crushing plates than those of Lepidosiren. The *L. paradoxa* is found in the Amazon; *L. annectens* in the Gambia.

DIPPEL, Johann Conrad, mentioned in the following article, had a strange and adventurous life, and has been severely handled by his biographers. He was the son of a clergyman, and was born in 1672 or 1673—both years are mentioned—at Frankenstein, near Darmstadt. He was extremely quick and inquisitive, and at the age of sixteen went to Giessen to study theology. While there he took part in the controversies between the orthodox party and the Pietists, supporting the former; and failing to get a post in the university, became a private teacher. Afterwards, when he was about to obtain a professorship, he held a disputation which seemed so full of dangerous opinions, that the appointment was opposed successfully by the university. He next went to Wittemberg, where his reception was a chilling one, then to Strasburg, where his pride received a check that nearly threw him into a fever. He spent about a year in Strasburg, but appears to have acquired an unenviable reputation for his turbulent life, and to have maintained himself by charlatanism of the commonest kind. Being at last engaged in a brawl in which one of the combatants was fatally wounded, he escaped arrest with some difficulty, and took leave of Strasburg as soon as possible. After wandering about for some weeks he betook himself to Darmstadt, altered his mode of life, and siding with the party he formerly opposed, became a complete enthusiast. But not meeting with the advancement he expected, and having frustrated a matrimonial project by which he hoped to benefit himself, he was about returning to his Strasburg habits, when he met the famous Gottfried Arnold, who was able to put a check upon him. He now openly defended the Pietists, and attacked the orthodox Lutheran party, not forgetting those who, at Giessen and elsewhere, had declined his support in earlier days. But this also was without result; and he finally wrote a tract which appears to have ruined him with all parties, and to have provoked replies in the same spirit as that in which the attack had been made. Dippel, however, was not without adherents, who helped him to live for some years after this. While fretting, apparently at his dependence, he fell in with some alchemical books, and at once threw himself, with all his enthusiasm, into the search for the philosopher's stone. In this also he was assisted by others, who hoped to profit by the discovery, but when no result was obtained, and the money was not forthcoming, Dippel retired to Berlin, where he induced some persons of rank and wealth to help in the search. During his residence here he produced his oil, from which followed indirectly that of Prussian or Berlin blue—an accidental discovery it is true, but one of a class that could hardly have been made but for the constant and multifarious, though not well-directed labours, of such men as Dippel. While in Berlin he was arrested for some cause, and after being liberated was going to be again imprisoned, but he disguised himself and escaped, and after some time arrived in Holland. Here he practised medicine, took the degree of doctor at Leyden, wrote a thesis in which the virtues of the animal oil are set forth, got into debt, and then went to Altona. He here mixed himself up

in municipal affairs, criticized the authorities, and had to leave for Hamburg, whence he sent a formal accusation against the Altona authorities to Copenhagen. A commission was appointed; Dippel was brought to Altona, and as his charges could not be substantiated, his accusation was burned by the executioner, and he was imprisoned for life in the island of Bornholm. During his stay there the governor of the prison was persuaded to grant him some freedom; he practised medicine, was in considerable esteem, when his term of confinement was shortened, and he was liberated. He then went to Sweden, was invited to the court on account of the king's illness, which had baffled the physicians, was the cause of disputes and ill-will between the church and the state parties, so that after reiterating some of his extreme theological views, he was desired to leave the country. He returned to Copenhagen, and then passed to Germany, where he went about among his adherents, and published a number of controversial writings. He died 25th April, 1734.

DIPPEL'S OIL, the black fetid oil, containing ammonic carbonate, which comes over when animal matter, such as stag's-horn, ivory, blood, is destructively distilled, was used in medicine, though its appearance and odour were strongly against it, until Dippel, in the seventeenth century, refined it by washing with lime or potash, and rectifying the oil ten or twelve times, until it came over limpid and aromatic, the black impurities being left in the retort. This rectified oil was the oleum animale Dippelii of the older pharmacopœias, which was prescribed in doses of a few drops as an antispasmodic and diaphoretic, and as a hypnotic. The oil is no longer used in medicine, and even the crude oil from stag's horn can hardly now be obtained, but a substance essentially the same is produced in large quantity by the dry distillation of bones for the manufacture of animal charcoal, and is known as bone-oil. This substance has been especially examined by Dr. Anderson, who obtained picoline and other bodies from it, products of destructive distillation which are known to exist also in coal-tar.

DIPPER. This name is sometimes given to the dabchick (*Podiceps minor*), but is more properly applied to members of the genus *Cinclus*, a sub-family of the thrushes (Turdidæ). The common dipper (*Cinclus aquaticus*) is a familiar European bird: it is about 7 inches in length, having a very short tail, rather small rounded wings, and large powerful feet; the bill is of moderate length, straight, and slender. The male has the upper part of the body brown, the throat and breast white, belly rusty; the bill is dark, and the feet are horn colour. The female has an ashy brown colour above, the breast less white, and a yellowish tinge on the belly. The dipper frequents rapid streams, and is of service to the angler, since its prey is largely the insects and larvæ which are, like that of the dragon-fly, destructive of spawn and newly hatched fish. The dipper dives and moves some distance under water, and effects its progress by grasping the stones at the surface, thus walking, not merely swimming or flying under water. The nest is a mossy bundle with a central cavity, concealed in clefts of rock; the eggs are five or six in number, and in Scotland are hatched out in April. The song of the bird is a sweet lively note, and is retained throughout the year. The dipper or water-ouzel must be distinguished from the ring-ouzel (*Turdus torquatus*), which has the white of the breast confined to a single transverse band. Dippers are met with all over Europe, in Asia Minor, and eastward as far as Japan. It is probable that the same species occupies this extended area, and that local varieties have been erected into the species *C. Pallasii* and *C. melanogaster*.

DIPPING, among miners, signifies the interruption of a vein of ore—an accident that often gives them a great deal of trouble before they can discover the ore again.

DIPPING-NEEDLE, or INCLINATION COMPASS, an instrument for measuring the *magnetic dip* or *inclination;* that is, the angle which a magnetized needle, free to move in the plane of the magnetic meridian, and about a horizontal axis, makes with the horizontal plane at the place. The dipping-needle is a light magnetized steel bar supported on a horizontal axis which passes, as nearly as possible, through the centre of inertia of the bar. The axis is either a steel knife-edge which rests on agate plates, or a fine wire supported by friction-rollers. A vertical circle surrounds the needle, the axis on which the needle turns being at the centre; the circle is graduated, and the needle moving over the graduations, the inclination to the horizon can be read off by means of it. The vertical circle is mounted on a vertical pillar, which turns round its own axis; and to the pillar there is attached at the foot an arm or pointer, which moves over a horizontal graduated circle. This last is supported on three legs furnished with levelling screws.

To observe with the dipping-needle the vertical circle must be placed in the plane of the magnetic meridian, and then the angle at which the needle is inclined must be read off by means of the graduations on the circle. The plane of the magnetic meridian might, of course, be determined by means of a separate instrument, such as the *declination compass* (which see). But this is not necessary, the vertical pillar and horizontal circle described above furnishing all that is required. A complete observation is made in the following way. The instrument having been properly levelled, the vertical circle is turned round on the pillar till the needle points *vertically downwards*. When this is the case we know that the needle must be moving in the vertical plane at right angles to the plane of the magnetic meridian, because it is only in this plane that there is no horizontal component of force acting on the needle. The vertical circle is now turned round on the pillar through 90°, which is done exactly by means of the horizontal circle at the foot. The needle is thus free to move in the plane of the magnetic meridian, and the inclination is read off.

Corrections for defects in the instrument, similar to those described in the case of the declination compass, must be applied in order to make the determination exact. In the first place, in order to correct for any error in centering of the axis on which the needle turns, readings are taken at both ends of the needle. Next, because the magnetic axis of the needle may not coincide with the axis of figure, the needle is turned over on its bearings, and fresh readings are taken, as is described in the case of the declination compass. Thirdly, the axis on which the needle turns may not pass exactly through the centre of inertia of the needle. If this were the case the needle would not balance about the axis exactly, one or other end of it being the heavier. To do away with error from this source, after one set of readings have been taken as has just been described, the needle is lifted from its bearings and remagnetized, the end that was formerly north being now made the south end. A complete new set of readings is taken. The mean of all these gives the true inclination.

DIPSACUS. See TEASEL.

DIPSOMANIA (Greek, *dipsa*, thirst, and *mania*, madness), a term recently introduced to denote an insane craving for intoxicating liquors, when occurring in a confirmed or habitual form. It is often

associated with other forms of nervous or mental derangement, and may be, in connection with one or more of these forms, hereditarily transmitted.

DIPTERA, an order of two-winged insects, of which the common house-fly and blue-bottle are familiar examples. They are characterized by a body with slight coriaceous coverings, a trunk open beneath, and containing a sucker composed of two, four, or six lancet-shaped elongated scales, two palpi, antennæ, almost always composed of three joints, large eyes, an abdomen of four to seven distinct segments, tarsi with five joints, and two short clubbed appendages called *halteres* or balancers, which seem to be the rudiments of the posterior pair in four-winged insects, and are kept in continual motion. They all undergo a complete metamorphosis. The larvæ are usually without feet, and have the body composed of twelve segments exclusive of the head, which is sometimes horny and sometimes fleshy. They are all oviparous except the Sarcophaga, which issue from their mother in shape of larvæ; and the Pupipara, which first make their appearance as nymphs. The order includes a great number of genera and species, and individually exists in such countless hosts as enables them, though generally of small size, to perform an important part in the economy of nature. They are found in the earth, the air, and the water, in all climates and in all localities. Some feed on blood, others fasten on other animals to lick up their perspiration, their sores, or various secretions; and not a few follow us into our houses and deposit their eggs among our food; but the far greater number live exclusively on the sap of flowers.

DIPTYCHA (Greek) originally signifies the same as *diploma*, something folded. The Greeks and Romans, among other materials for writing, used tablets of metal, ivory, or wood of equal size, fastened together by a hinge or little ring which went through them, that they might be more easily carried or passed from one hand into the other. Such double tablets were originally called *diplomata* or *diptycha*. Both terms, however, afterwards received different significations. The diptycha became important in the Christian church, and were of three sorts, containing the names of the bishops, of the living, and of the dead. The first contained the names and lives of deserving bishops. It was customary to read them at festivals, which gave rise afterwards to the custom of canonization. In the diptycha of the living the names of popes, patriarchs, bishops, and other ecclesiastics, then the names of the emperors, kings, princes, and other distinguished persons, who had deserved well of the church, though still alive, were written down, to be mentioned in the church prayers. The diptycha of the dead, finally, comprised the names of those who had departed in the Lord, which were also mentioned in the church prayers. There was also another species of diptycha, containing the names of the baptized. The profane diptycha were frequently sent as presents to princes, &c., on which occasions they were finely gilt and embellished. Those presented were usually made of ivory.

DIRÆ, or EUMENIDES. See FURIES.

DIRECT. In astronomy, the motion of a planet is said to be *direct* when it appears to move forward in the zodiac according to the natural order and succession of the signs, or from west to east; *retrograde*, when it moves in the opposite direction. A comet is said to have direct motion when it travels round the sun in the same direction as the planets, retrograde when it travels in the opposite direction.

DIRECTORS, persons elected to manage or direct the affairs of corporations or joint-stock companies, such as railways, banks, assurance companies, gas companies, &c. A railway director is bound to administer the affairs of the company only with the means lawfully put at his disposal, and is not expected to incur any personal liability to sustain the general operations. In the case of banks, there are usually two sets of directors—ordinary and extraordinary. The former usually conduct the business of the undertaking, while the latter attend only on particular occasions. It is the rule with bank as well as railway directors that they must respectively hold some shares in the concern. Being usually business men, it is expected that the directors of banks, railways, and assurance companies cannot be expected to give their services gratis, and at the meetings of the shareholders small sums are allotted as payment. The sum so set apart, usually half a guinea per meeting for each director, is divided among those actually present. The duties and responsibilities of the directors are defined by the constitution of the company, or by the act of Parliament by which it is established.

DIRECTORY, a guide, a rule to direct. This name was given to five officers, to whom the executive authority in France was committed by the constitution of the year III. (1795). This regulation was imitated in other states over which France exercised an immediate influence, as in Switzerland, Holland, &c. The two legislative bodies, called the *councils*, elected the members of the directory: one member was obliged to retire yearly, and his place was supplied by election. This body was invested with the authority, which, by the constitution of 1791, had been granted to the king. The seven ministers of state were immediately under, and were appointed and removed by the directory. By the revolution of the 18th Brumaire this body and the constitution of the year III. were abolished. It was succeeded by the consulate.

DIRK, a kind of dagger formerly used as a weapon of offence by the Highlanders of Scotland. Dirks are worn by midshipmen and cadets of the royal navy, and an elaborately ornamented form is an indispensable item in a full Highland costume.

DIRK-HARTOG ISLAND lies on the west coast of Australia, south from Naturaliste Channel, one of the entrances to Shark Bay, lat. 25° 31′ s.; lon. 112° 54′. The island measures 45 miles long, north to south, and 10 miles broad.

DISABILITY, in law, incapacity to do any legal act. It is either *absolute*, which wholly disables the person; such as outlawry or excommunication—or partial, such as infancy, coverture, insanity, or drunkenness.

DISBANDING, in military affairs, signifies the breaking up of a regiment or corps. When the conclusion of a war necessitates a reduction of the army, it is effected by disbanding; the men are discharged, and the officers are placed on half-pay.

DISBARRING, expelling a barrister from the bar, a prerogative which, in England, is possessed by the benchers of each of the four Inns of Court. The party disbarred may lodge an appeal with the fifteen judges. In Scotland the power to disbar is vested in the Faculty of Advocates.

DISCHARGE, a substance such as chloride of lime or nitric acid, used by calico-printers to remove a colour. Suppose a white pattern is to be produced on a uniformly coloured ground. The cloth is first dyed, and then the pattern is printed with an acid, such as the tartaric, thickened with gum. When passed through a dilute solution of bleaching-powder, the acid decomposes it, and the liberated chlorine destroys the colour at the parts where the pattern was printed. Sometimes the cloth is prepared at the same time for subsequent pigment printing.

DISCHARGE from the military service is of two kinds: voluntary and involuntary. In the first case

a non-commissioned officer or private, by paying a certain sum of money, may quit the service if sanctioned by his commanding officer. This sum may amount to as much as £20, if his term of service is at a distant date; and if the soldier is in the sappers and miners the discharge-purchase is even higher, sometimes reaching to £35. In the second case a soldier may be discharged 'with ignominy' for an offence bringing dishonour on the corps. The offender is brought in front of the whole regiment to receive sentence. The buttons, medals, facings, and all decorations are cut from his uniform, and if belonging to the infantry he is 'drummed out' of the regiment; if to the cavalry, by sound of trumpets. Notice of this degrading discharge is then sent in writing from the war office to his parents or relations.

DISCIPLINE, in military and naval affairs, is the general term applied to the rules laid down for the behaviour of those connected with those services. The mutiny act, the articles of war, and the general orders issued from the war office or the admiralty combined form the code by which discipline is regulated. Regimental discipline is chiefly maintained by the adjutant. He inspects and tells off all guards, escorts, and parties; keeps the regimental books; receives all garrison orders; superintends the drill and field movements, &c. In matters of discipline the adjutant-general is to the whole army what the adjutant is to a regiment.

DISCIPLINE, Books of The First Book of Discipline of the Scottish Kirk was drawn up by John Knox and four other ministers, and laid before the General Assembly in 1560. It was also submitted to the privy-council; and though not formally ratified by them, it was subscribed by the greater part of the nobility and barons who were members of the council. Another similar document, which bears the name of the Second Book of Discipline, was prepared and sanctioned by the General Assembly of 1578; and from that time it has been recognized as the authorized standard of the Church of Scotland in respect of government and discipline. It begins by stating the essential line of distinction between the civil and ecclesiastical power. Civil authority has for its object the promoting of external peace and quietness among the subjects; ecclesiastical authority, the direction of men in matters of religion and those which pertain to conscience; yet as 'both authorities are of God and tend to one end if they be rightly used, to wit, to advance the glory of God, and to have good and godly subjects,' they ought to cooperate within their respective spheres, and fortify each other. The government of the church consists in three things—doctrine, discipline, and distribution. Corresponding to this division there are three kinds of church-officers: ministers, who are preachers as well as rulers; elders, who are merely rulers; and deacons, who act as distributors of alms and managers of the funds of the church. The office-bearers of the church are to be admitted by election or ordination. None are to be intruded into any ecclesiastical office contrary to the will of the congregation to which they are appointed. Ecclesiastical authorities are either particular, provincial, national, or ecumenical and general. The presbytery has the inspection of a number of adjoining congregations in everything relating to religion and manners, and has the power of ordaining, suspending, and deposing ministers, and of exercising discipline within its bounds. The provincial synod possesses the powers of all the presbyteries within the province. The General Assembly is composed of commissioners, ministers, and elders from the whole churches in the realm, and takes cognizance of everything relating to the welfare of the national church. Appeals for redress of grievances may be taken from every subordinate court to its next superior one, till they reach the General Assembly, whose decision in all ecclesiastical matters is final.

DISCLAIMER, in law, a plea containing renunciation or a denial of some claim alleged to have been made by the party pleading. The term is also applied to the refusal to accept a gift or devise of land or other property, and generally to the waiving of any claim.

DISCORD. A *discord* is a dissonant or inharmonious combination of sounds, so called in opposition to the *concord*. To discords prepared and resolved the term *dissonance* (which see) is now more generally applied.

DISCOUNT, the charge made by a banker for interest of money advanced by him on a bill or other document not presently due. In advancing on such a security the banker deducts the charge for interest on his advance from the total amount represented on the security, pays the difference, which is called the *proceeds* of the bill, to the discounter, and collects the full amount to reimburse himself for outlay and interest at maturity. Popularly the term *discount* is applied to any allowance made on account on payment. When a bill which has been *discounted* is paid by the acceptor before it is due, the discount allowed for prepayment is called *rebate*.

DISCOVERY, in law, the act of revealing or making known any matter by a defendant in his answer to a bill in chancery.

DISCUS, Disc, or Disk, among the Greeks and Romans a quoit of stone or metal, convex on both its sides, sometimes perforated in the middle. The players aimed at no mark, but simply tried to throw the quoit to the greatest possible distance. The disc rested on the forearm, and was grasped at the outer edge by the hand. A large form, called the *solos*, was furnished with a thong of leather, by means of which it could be more easily swung to a greater distance. Throwing the discus was one of the gymnastic exercises; and in the Olympic and other games it was considered a great honour to conquer in the contest. Perseus is said to have invented this instrument, and Apollo killed his favourite, Hyacinth, with it.

Disk, in astronomy, means the face of the sun and moon as they appear to observers on the earth.

DISEASES, Hereditary. The influence of the parents on the organization of the child is so great that even the individual peculiarities which distinguish one man from another are, in part at least, transmitted to his children; hence the similarity, in person and looks, of the child to its parents. The internal organs too, as well as the external form, have the same resemblance; so that the peculiar constitution, the greater or less activity and development of these organs, are found to pass from parent to child. Now, as it is the particular state of the several organs and functions in which a very great part of diseases have their foundation, it follows that these diseases may be inherited, and, in fact, it has been observed that the son is not unfrequently attacked by a disease at the same period of life in which his father was. These diseases are called *hereditary;* but it is only the predisposition to them that is, properly speaking, inherited. Hence the actual development of hereditary diseases requires certain co-operating circumstances. Constitutional diseases are very often not hereditary, but depend on circumstances which affect the fœtus during pregnancy. The father has no influence on the child beyond the act of generation; the mother operates upon it during pregnancy, and it is possible that hereby occasion may be given to hereditary diseases. Among the diseases which are

most frequently hereditary are scrofula, bleeding (especially at the lungs) and hemorrhoids, consumption, gout, the gravel and stone, cancer, disorders of the mind and spirits, hysterical and hypochondriac affections, apoplexy, epilepsy, and organic diseases of particular parts, especially of the heart. They have this peculiarity, that they are produced, and appear as constitutional diseases, more from the action of internal than of external, of predisposing than of occasional causes. Such diseases are much more difficult to reach and to cure than those which originate in accidental external causes. Hence it is especially necessary to prevent in season their growth and development. The means of doing this are the following:—1. Whoever has a hereditary predisposition to any disease should not marry one who has the same constitution. For this reason marriages between near relations are not advisable, as tending to perpetuate such hereditary diseases. This, too, appears to be the reason why attachments are generally formed between persons of opposite constitution and different temperament. 2. We ought to order all the circumstances in which the child grows up in such a way that the inherited predisposition may not only not be favoured, but counteracted. 3. The accidental occasions which favour the growth of the disease should be avoided, especially at the time of life in which the father was attacked by it. The medical treatment of hereditary diseases is not essentially different from that which is requisite in the same diseases arising under different circumstances.

DISEASES OF PLANTS may be divided into two main classes: those produced by temperature, excess or deficiency of moisture and light, impure air, the composition of the soil, and other mechanical or chemical agencies; and those produced by other organized beings, whether belonging to the animal or vegetable world. Too high a temperature will produce an excitement inconsistent with healthy growth, and, as it advances, will dilate the tissues to such a degree that all vital functions will cease. On the other hand, a low temperature is equally fatal, by destroying the connection between the cells, so that the parts affected are no longer masses of closely connected tissue, but, to a great extent, of completely isolated vesicles; that extreme cold is one of the chief causes of canker can scarcely be doubted. Light is an important element in healthy vegetation. A gloomy season is in general unfavourable to plant life. Without light the chemical changes necessary to the complete development of the chlorophyll will not take place, and the plant is in consequence blanched. Some plants, however, prefer the shade, and perish if exposed. Tender tissues frequently require protection from a too free admission of light. In tropical forests, most unhealthy to man, certain vegetables find an atmosphere congenial to their growth, but in most cases pure air is indispensable. This may be seen from the cultivation of plants in the heart of towns, where they sicken and die, owing to the large quantity of soot and dust being deposited not only on their leaves, but within the stomata, thus hindering the processes of respiration and evaporation. Partly from its agency in mixing the constituent parts of the atmosphere, and partly probably from the agitation of the vegetables themselves, wind, within certain limits, is considered beneficial to vegetation. Few things are more prejudicial to plant life than excess of moisture, partly from its immediate action on the tender tissues of the roots, and partly from decomposition, due to its constant presence, existing in such a degree that the water is imbibed in a state unfit for healthy growth, but, more than all, to the low state of temperature which is kept up at the very point where a certain degree of heat is essential. As all nutriment is derived from the soil by means of water, it is evident that an insufficient supply would be highly detrimental. A very large portion of the diseases of plants springs from the depredations of the animal world, or the inroads of parasitic animals and vegetables. These may be classed as direct injuries, alterations of tissues from the presence of larvæ of insects, exhaustion or depravation from parasitic insects, phenogams, and fungi. With regard to the diseases of plants generally, little has been hitherto discovered in the way of cure, and prevention is generally the chief object aimed at in all investigations of their nature and causes.

DISHING WHEELS. Wheels should be exactly cylindrical if roads were, in all cases, level and smooth; but since the unequal surface of most roads exposes carriages to frequent and sudden changes of position, it is found advantageous to make the wheels a little conical, or, as it is commonly called, *dishing*, so that the spokes may all diverge with their extremities from the carriage.

DISHONOUR OF A BILL is the refusal or neglect to accept or pay when due a bill of exchange, or promissory note, or draft on a banker. It is absolutely necessary that the holder of a dishonoured bill should give notice of the non-payment to the drawer or indorsers, such notice to be sent on the next day if the parties reside in the same place, or by the next post if at a distance. No particular form of notice is requisite; it is sufficient if it is such as to identify the bill, and to inform the party to whom it is given of the protest, a copy of which should accompany it.

DISINFECTANT. As distinguished from an antiseptic, which is a substance that prevents putrefaction taking place, and from a deodorizer, which conceals or removes an odour that may or may not be infectious, a disinfectant is a substance that prevents or destroys infection. Several such substances —frequently bearing the name of the maker—are in use; for example, charcoal to absorb disagreeably smelling gases, lime and lime-wash for the same purpose, and to destroy low vegetable growths, arsenic acid, sulphate of copper, bichromate of potassium, carbolic acid, creosote; Sir W. Burnett's fluid, which contains chloride of zinc; Condy's green and red fluids, containing respectively a manganate and a permanganate; Dewar's sulphur spray, a solution of sulphurous acid; Ellerman's liquid, containing a ferric salt; Guyton's fumigation with chlorine gas; Eau de Javelle, containing chloride of potash; Labarraque's solution, containing chloride of soda; Ledoyen's fluid, containing nitrate or acetate of lead, to absorb sulphuretted hydrogen; Macdougall's disinfectant, containing carbolic acid and sulphite of calcium; Smith's fumigation by means of nitrous gases. Infection has also been destroyed by heating to a moderately high temperature. The chemical reactions of most of the bodies enumerated are well known, and it is generally believed that when they act successfully—which, however, is not invariably the case—it is by virtue of their chemical activity. This, however, seems to assume that all infectious influence is the same, or at least is attacked and destroyed in the same way, a point not yet demonstrated, however probable it may be. The nature of infection is only a division of the question of the origin of disease in general, and of the existence of disease and other germs in air, water, and articles of food; and as the opinions of experimenters are as yet often quite opposed to each other, the practice is purely empirical. It is quite obvious that until it has been approximately settled what infection is, and how it acts, no rational disinfecting system, founded on the behaviour, chemical or otherwise, of the disinfectant, and prescribing in accordance therewith the

method to be followed in particular cases, can be laid down. At present the substances considered most efficacious are chlorine and the bleaching liquids, permanganate solution, carbolic acid, and sulphurous acid, but their effects vary considerably in kind and in intensity, and in some respects they are surpassed by corrosive sublimate, sulphate of copper, and bichromate of potassium.

DISLOCATION, a surgical term, applied to cases in which the articulating surfaces of the bones have been forced out of their proper places, usually by external violence, but sometimes also in consequence of disease. The particular dislocation takes its name either from the joint itself or its furthest bone, and is called *compound* when accompanied with an external wound exposing the cavity of the joint. The most common dislocations are those of the hip, shoulder, elbow, knee, and ankle, and the chief obstacle to their reduction is the spasmodic and violent contraction of the muscles consequent upon them, often requiring the application of considerable force. The most dangerous dislocations are those of the bones of the spine.

DISLOCATION, in geology, signifies the displacement of parts of rocks or portions of strata from the situations they originally occupied. See GEOLOGY.

DISMAL SWAMP, a large tract of marshy land in America, beginning a little south of Norfolk, in Virginia, and extending into North Carolina, containing 150,000 acres: 30 miles long, from north to south, and 10 broad. This tract is entirely covered with trees, some of which grow to a very large size; and between them the brushwood springs up so thick that many parts are utterly impervious. In the midst of the swamp is a lake, called *Drummond's Pond*, 7 miles in length. The Pasquotank flows from this lake south, and the Nansemond flows from it north.

DISMANTLED, the state of a ship unrigged, and all her stores, guns, &c., taken out, preparatory to her being laid up in ordinary, or going into dock for repairs, &c. To dismantle a gun or fort is to render it of no service.

DISMOUNTING, in the military art, is rendering the enemy's cannon unfit for further service, by breaking their carriages and axle-trees; also shattering the parapet of a fortification by balls, so that it cannot be defended, particularly so that cannon cannot be worked behind it. Dismounting batteries are such as are intended to throw down the parapets of fortifications, and disable the enemy's cannon.

DISPART, the difference between the semidiameter of the base ring at the breech of a gun and that of the ring at the swell of the muzzle. On account of the dispart the line of aim makes a small angle with the axis, so that the elevation of the latter above the horizon is greater than that of the line of aim. An allowance for the dispart is therefore necessary in determining the commencing of the graduations on the tangent scale, by which the required elevation is given to the gun.

DISPENSARY, a charitable institution common in large towns in Great Britain and the Continent. Dispensaries are mostly supported by voluntary subscriptions, and each has one or more physicians, surgeons, and apothecaries, who attend, or ought to attend, at stated times in order to prescribe for the poor, and, if necessary, to visit them at their own habitations. The poor are supplied with medicines gratis. Where these institutions are managed with care they are of the utmost importance to society, it being unquestionably more for the comfort of the sick to be attended at their own houses than to be taken from their families to an hospital.

DISPENSATION is the act by which an exception is made to the rigour of the law in favour of some person. To make a dispensation is an act of sovereign power. In the Roman Catholic Church it is defined as a release from the obligation of observing some ecclesiastical law, accorded to a person for some just and reasonable cause by the proper authority. The pope may release from all oaths or vows, and may sanction a marriage within the prohibited degrees of the Mosaic law, or exempt from obedience to the disciplinary enactments of the canon law. In England the monarch claimed, in former times, the dispensing power in civil law similar to that possessed by the pope in ecclesiastical matters. The prerogative was, however, so much abused by James II. in favour of the Roman Catholics that it was expressly abolished by the Bill of Rights. The power of commuting sentences in capital cases is the only form in which the dispensing power of the crown still exists. In ecclesiastical matters a bishop may grant a dispensation allowing a clergyman to hold more than one benefice, or to absent himself from his parish.

DISPENSATORY, the same as PHARMACOPŒIA (which see).

DISPERSION, an optical term applied to the angular separation experienced by the component rays of a pencil of light on emerging from a refracting medium, whose surfaces are not parallel to each other, as in the case of the common prism. According to the Newtonian theory of light this dispersion is owing to the unequal refrangibility of the heterogeneous particles of which light is composed; while, according to the undulatory theory, it is ascribed to the modifications which the undulatory movement undergoes, when under certain conditions it is propagated from one medium to another.

DISPOSITION, in Scotch law, is, in its general acceptation, a deed of alienation by which a right to property heritable or movable is conveyed. The disposition most frequently used is that by which heritable property is conveyed to a purchaser, but a disposition of movables is a well-known deed; and where a person (disponer) wishes to settle his whole succession, heritable and movable, it may be done by a general disposition and settlement. The disposition of heritage usually contained eleven clauses, some of which have now been shortened, and others dispensed with by the 10 and 11 Vict. cap. xlviii. and the 21 and 22 Vict. cap. lxxvi.

D'ISRAELI, ISAAC, father of the well-known statesman, was born at Enfield, Middlesex, in 1766. His father, Benjamin D'Israeli, was the descendant of a family of Spanish Jews which had settled at Venice in the fifteenth century to escape the persecutions of the Inquisition. He came over to England in 1748, made a large forture by commerce, and married a lady, also of Jewish extraction. The subject of the present article was intended to follow a similar career to his father, but from the first manifested an invincible repugnance to commercial pursuits, and notwithstanding all the remonstrances of his father, insisted on devoting himself to literature. His first production was a poem against commerce, which in his juvenile enthusiasm he considered as the corrupter of morality, and this he left at Bolt Court for the perusal of Dr. Johnson, who was, however, then too ill to read it, and shortly afterwards died. In 1788 he was sent by his father to travel in France, and on his return published anonymously a poem On the Abuse of Satire, being a reply to some of the lucubrations of Peter Pindar, then in the height of their popularity. Shortly after this his father agreed to let him follow unrestrainedly his own inclinations in his mode of life, and settled upon him a yearly allowance. In 1791–93 appeared his Curiosities of Literature, about the most entertaining of his works, and

that by which he is best known at the present day. Its success was such as to determine D'Israeli to pursue the same path through the literary field, the collection of instructive and amusing gossip relative to literary men and their writings. His Essay on the Literary Character was published in 1795, and sometime afterwards a volume of romantic tales, entitled The Loves of Mejnoun and Leila, which reached a second edition, but cannot be said to have added greatly to his reputation. From this period up to 1812 he appears to have been principally engaged in the collection and preparation of literary materials, the results of his labours appearing in the following works, published between that year and 1822:—Calamities of Authors; Quarrels of Authors, or Memoirs of Literary Controversy; and Inquiry into the Literary and Political Character of James I. These were afterwards published collectively under the title of Miscellanies of Literature. In 1828 appeared the commencement of his Life and Reign of Charles I., a work completed in five volumes in 1831, and for which the University of Oxford conferred on him the degree of D.C.L. His next projects were a Life of Pope and a History of the English Freethinkers, but neither of them were carried into execution, owing to an affection of the eyesight with which he was attacked in 1839. In 1841 appeared, in three volumes, his Amenities of Literature, selected by him from his manuscripts, with the assistance of his daughter. He died in 1848, aged eighty-two. D'Israeli was a man of a pensive and solitary turn of mind, and his life was quite that of a literary recluse, spending the greater part of his time in his library. A memoir of him, prefixed to a new edition of his Curiosities of Literature, has been published by his son, the Right Honourable Benjamin D'Israeli.

DISRUPTION, the name commonly applied in Scotland to the act by which, in 1843, about 400 ministers gave up their livings to vindicate principles which they held to be essential to the purity of the church, and in harmony with its earlier history. They held themselves at liberty to return to the church from which they retired when she had purified herself by abandoning the obnoxious opinions on civil and ecclesiastical government which had caused the rupture. See FREE CHURCH.

DISS, a market-town, England, Norfolk, on the slope of a hill, at the foot of which is a small lake or mere, on the north side of the vale of the Waveney, 18 miles south by west from Norwich. The streets are wide and well paved, with neat houses and handsome shops. St. Mary's church is a fine Gothic structure with a square tower at the west end. Diss was formerly noted for the manufacture of 'Suffolk hempen cloth,' worsted yarn, and knit hosiery, but these branches have now much declined. Pop. 3851.

DISSEIZIN, or DISSEISIN, is the dispossessing one of a freehold estate, or interrupting his *seizin*. Under the feudal law, when a vassal was admitted to an estate by the ceremony of investiture, he was said to be *seized* of it. The disseizing of him was the turning him out of his fee. In regard to incorporeal hereditaments, as of a certain office, or the right to receive a certain rent out of land, without that of possession, there could be only a constructive disseizin. The person disseizing another is called the *disseizor*, and the person whose estate is disseized, the *disseizee*. Of freeholds only can a seizin be had, or a disseizin done. Whether an entry upon lands is or is not a disseizin, will depend partly upon the circumstances of the entry, and partly upon the intention of the party, as made known by his words or acts. Thus, if one enters another's house without claiming anything, it is not a disseizin. So, if one enters wrongfully upon another's land, and the owner afterwards receives rent of him, it will not be a disseizin; so, if a lessee at will makes a lease for years, it is a disseizin; so, if one enters upon the lands of an infant, though with his consent, it is a disseizin, if the infant chooses afterwards so to consider it; so, if one commands another to make a disseizin, the person giving the command is a disseizor; and so it is a desseizin to prevent the owner from entering on his land, &c.

DISSENTERS, the common name by which all Christian denominations, excepting that of the Established Church, are usually designated, though in acts of Parliament it generally includes only Protestant dissenters, Roman Catholics being referred to under their specific name. In Great Britain the most important bodies of English dissenters are the different bodies of Methodists and the Independents, including the Baptists; and of Scotch dissenters, the Free Church and the United Presbyterian Church. All these dissenters are nearly agreed in doctrine, and differ chiefly in regard to church government and the propriety of a formal connection between the church and the state. In England the Wesleyan Methodists are understood to be generally favourable to this connection, and in Scotland the same view is held still more decidedly by the Free Church. See NONCONFORMISTS and PURITANS.

DISSOCIATION. It is now considered fully established that when a definite chemical compound can be converted into vapour, the specific gravity of the vapour compared with hydrogen gas as the standard, amounts to half its combining weight; or, otherwise, that the vapour volume of all compounds is two. In the case of hydrochloric acid, for example, the combining weight of which is 36·5, the theoretical specific gravity will be 18·25, with which the experimental result closely agrees. Any departure from this is considered an anomaly, which requires explanation. Now there are certain bodies, such as sulphuric acid, ammonic chloride, and some others, which, when converted into vapour, have a specific gravity a quarter of their combining weight, or occupy four volumes instead of two. The explanation given of this is, that at the temperature required to convert these bodies into vapours, they decompose, and their constituents occupy each two volumes according to the general law. In fact, the four-volume vapour from sulphuric acid does not consist of gaseous sulphuric acid, but of two volumes of water-vapour and two volumes of sulphuric anhydride; that the four volumes from ammonic chloride consist of two volumes of hydrochloric acid gas and two volumes of ammonia gas. This separation or decomposition at a high temperature is termed dissociation, and it has been attempted to prove, by actually collecting the products separately, that it is the proper explanation of the phenomenon; but though it may be correct for some cases, it leaves others unexplained.

In his writings on dissociation Ste. Claire Deville uses the term in a more extended sense, as denoting the separation of a body into its constituents (whether simple or compound) at a temperature inferior to that at which its composition is usually seen to take place. The starting-point of his investigation is Grove's decomposition of water by incandescent platinum. When aqueous vapour is heated to 1000° Cent. (above 1800° F.), it begins to decompose and give off oxygen and hydrogen gas, but this ceases as soon as the gas acquires a certain tension. If the temperature be now raised, say to 1200° Cent. (2200° F.), the vapour undergoes a fresh decomposition, and gas is evolved until a different tension has been reached, when the decomposition stops. In this way

the tension of the gas produced by the decomposition of water increases with the rise of temperature. To this mode of decomposition the name dissociation has been given, and to the tension for a given temperature the name dissociation-tension.

If now the temperature of the second stage be lowered to that of the former, the excess of gas at the higher recombines to form water, and there remains the gas with the tension corresponding to the lower temperature. Hence vapour of water and other compound gases, passed through the hottest tubes, seem not to be affected, because they have been cooled down to the point of the recombination of their constituents by the time they are collected. Deville's experiments were so arranged as to prevent the mixture of the dissociated constituents until after they had been cooled below the point of recombination. This was effected in the case of water, for example, by allowing the hydrogen to diffuse through a porous tube into an external atmosphere of carbonic anhydride, and he obtained in this way about a cubic centimetre of detonating gas from a gramme of water (0·06 cubic inch from 15·5 grains). By suitable arrangements he has also caused the dissociation of carbonic oxide and carbonic anhydride, sulphurous anhydride and hydrochloric acid, the last with great difficulty. Sulphurous anhydride was decomposed in a silver tube, which was blackened by the formation of some sulphide, while sulphuric anhydride was also formed.

The tension of dissociation and its increase with the temperature is exhibited by the effect of heat upon Iceland-spar in an exhausted tube. When heated in vapour of cadmium a certain amount of gas is given off until it reaches a certain tension; then when the temperature is raised by heating in vapour of zinc, a fresh quantity at a different tension is evolved. On cooling, the gas is entirely reabsorbed. If the gas be removed, and the pressure thus reduced, a fresh quantity is evolved until the tension for the temperature is reached. In connection with this subject the combination of bodies within certain limits of temperature is well illustrated by the following experiment. Eleven grammes of lime from Iceland-spar, and 400 cubic centimetres of carbonic anhydride, at 753 millimetres pressure and 14° Cent., were heated together in zinc vapour. At first the tension increased 17 millimetres, because lime does not absorb dry carbonic anhydride below 400° or 500° Cent. As it became red the tension rapidly diminished, till for a moment it stood at 32 millimetres. As the temperature increased, dissociation began, and gas was given off till the tension was 520 mm., after which it was constant for the temperature.

Results similar to the preceding were obtained with dry ammoniacal chloride of silver, and with efflorescent salts. Phosphate of sodium, with twelve molecules of water, gave off vapour of a certain tension amounting to five molecules; the remaining water was dissociated at a different temperature and of a different tension. Deville and Debray have pointed out the importance of these facts in connection with others; the analogy, for instance, between the vaporization of fluids and the dissociation of a gas from a solid; the so-called action of mass, as when sulphuretted hydrogen decomposes sodic carbonate, and reciprocally carbonic anhydride decomposes sodic sulphide, and the decomposition of gases during combustion.

DISSOLVING VIEWS are paintings upon glass magnified and thrown with great distinctness upon a screen by means of one or two magic lanterns with strong lenses, and illuminated by the oxyhydrogen light. If one lantern is used the picture is drawn out of focus gradually, and a second substituted, which is brought gradually into focus, thus producing the haze and brilliancy which have gained this sort of exhibition its name. If two lanterns are used, they are placed side by side with their lens tubes slightly convergent, so that the images may be superposed on the screen. An opaque rectangular shutter, capable of revolving vertically upon a pivot fixed midway between the lanterns, is placed before the lenses in such a position that, when horizontal, it cuts off one-half of the pencil of light from each lens. When this shutter is made to revolve through a small arc, it shuts off the whole of the pencil of light from lantern No. 1, allowing that from No. 2 to pass unhindered. When the shutter is in this position the image from No. 2 falls on the screen in full distinctness; but when the shutter is made to revolve in the opposite direction, the image from No. 1 will be gradually disclosed, as that of No. 2 becomes concealed.

DISSONANCE, that effect which results from the union of two sounds not in accord with each other. The ancients considered thirds and sixths as dissonances; and, in fact, every chord except the perfect concord is a dissonant chord. The old theories include an infinity of dissonances, but the present received system reduces them to a comparatively small number. They are introduced for the purpose of producing pleasant contrasts, as too much sweetness would cloy the ear. The most common are those of the tonic against the second, the fifth against the sixth, or (the most frequent of all) the fourth against the fifth. For the preparation and resolution of dissonances see MUSIC.

DISTAFF, the first instrument employed in spinning. It consisted of a staff, on one end of which the wool or flax was rolled. The spinner held it in the left hand, and drew out the fibres with the right, at the same time twisting them. A small piece of wood called a spindle was attached to the thread, the weight of which carried it down as it was formed. When the spindle reached the ground the thread which had been spun was wound round it, and it was then again fastened near the beginning of the new thread. It has been considered as the emblem of female as opposed to male occupations.

DISTEMPER, a disease of the dog commonly considered as of a catarrhal nature. In most cases a running from the nose and eyes is one of the first and chief symptoms. This defluction becomes after some time mucous and purulent, loading the eyes and obstructing the nostrils; and whenever the animal is subjected to a draught of air, or excitement of any kind, it has violent fits of coughing combined with vomiting, it soon begins to lose appetite, its flesh begins to waste, and it becomes listless and irritable. If the disease be virulent, symptoms of affection of the brain manifest themselves, accompanied by fits and paralysis of the extremities, or by convulsive twitchings, resembling St. Vitus' dance. In such cases the dog is often supposed to be mad, and frequently destroyed in consequence. Inflammation of the lungs is not an infrequent consequence of the disorder, and the bowels are more or less affected by diarrhœa and dysenteric discharges. Protracted cases are attended by eruptions on the chest and abdomen, and the surface of the body becomes of a yellow hue. These are always fatal symptoms. In the first stage of the disease laxatives, emetics, and occasional bleeding are the principal remedies; diarrhœa should be checked by astringents, and to reduce the violence of the fits warm bathing and antispasmodics should be resorted to. The disease is often fatal to delicate and weakly animals, and more so in town than in the country. Distemper resembles the strangles of young horses, and the scar-

latina and other such disorders of young children. Like these it is generally contagious, and occurs but once in a lifetime.

DISTEMPER (French, *détrempe;* Italian, *tempera*), in painting, a preparation of opaque colour mixed in a watery glue, such as size, whiting, or gum. It is used now chiefly in scene-painting and in paper for walls, but was employed in the higher departments of art before the establishment of oil or varnish painting in the fifteenth century.

DISTICH, a couplet of verses, especially one consisting of a hexameter and pentameter, as,

> 'Turpe quidem dictu: sed, si modo vera fatemur,
> Vulgus amicitias utilitate probat.'

No form is more suitable for maxims or sentences than the distich. The Greeks therefore composed their epigrams almost exclusively in this form, and the Germans have followed their example. Other nations who do not possess this measure frequently call every piece of poetry in two lines a distich.

DISTILLATION (*stilla*, a drop), a process in which the particular boiling-point of a liquid is taken advantage of to effect the separation of the liquid from a mixture (see SUBLIMATION). The operation may be considered under the heads of apparatus, heat, and substances distilled.

The apparatus consists essentially of four parts—the boiler or body, the head and neck, the condenser, the receiver. According to the scale of operations the body may range from a small test-tube or a little bulb blown on a glass tube to a large copper or iron boiler capable of holding many hundreds of gallons. The shape depends on the use. It may be broad and shallow, or it may be narrow and deep. It may be made of iron, copper, platinum, stone or earthen ware, glass. For large operations, such as spirit, copper is used; for sulphuric acid, platinum; for zinc and mercury, earthenware; for laboratory purposes, glass. The head in large apparatus is separable for convenience of cleaning, and is generally the bulkiest part. Its shape varies, sometimes it is globular, sometimes elongated and pear-shaped. From one side of it projects the neck, which is either a prolongation of the head bent over, or is a separate tube fastened into the head. The whole is called a *still*. When it is of small dimensions, and the body, head, and neck are all in one, it is called a *retort*, and is neither more nor less than a flask with a long neck bent over so as to make the angle between the body and neck about 10° less than a right angle. Retorts are usually made of glass. When the body is a glass flask, the neck may consist of a bent glass tube fitted to it by a cork. The condenser is a tube or other convenient vessel through which the hot vapour from the still is passed. The tube is kept at a temperature sufficiently low to cause the vapour to condense. The nature of the condenser depends on the volatility of the liquid. If the latter have a very low boiling-point, and rise readily in vapour, the condensing power must be carefully maintained by regulating the heat, by removing the warm condensing-matter and supplying cold. If it have a high boiling-point, passage through the neck kept cool by a bit of wet cloth may be a sufficient condensing arrangement, for most purposes a stream of cold water is enough, but for very volatile fluids ice or a freezing-mixture may be required. On the large scale the condenser consists of a tube coiled round in a tub or box filled with water, which flows in cold at the bottom, and flows off hot at the top. This coiled tube is called a *worm*. On the small scale a long straight glass tube fastened by corks or metal caps along the axis of a shorter and wider tube, a space being thus left between them in which water can circulate, is quite sufficient for ordinary purposes. Sometimes a glass worm is used. The receiver is a vessel in which the substance that comes over, called the *distillate*, is collected. If necessary it may be immersed in water or a cooling mixture, but it is preferable, when possible, to have the receiver quite free. For the distillation of certain substances the whole four parts may be in one, or may be made to fit closely together.

The heating of the still on the large scale is either by direct fire, or by steam, or by hot water; on the small scale in a laboratory, by a fire, by a gas or spirit lamp, or by a sand, water, brine, oil, or metal bath, according to circumstances.

The operation of distillation is performed by putting the crude liquid into the body and replacing the head, attaching the condenser, turning on the current of water, placing the receiver at the end of the worm, and applying heat until the liquid begins to boil. Suppose the liquid is water containing solid matter in solution or suspension; the water rises in vapour, passing through the condenser it is cooled and transformed into the liquid state, and drops or *distils* into the receiver. The solid matter remains in the still or retort. When the mixture consists of two or more fluids of different boiling-points, such as alcohol and water, the more volatile comes off first, accompanied by a certain proportion of the vapour of the other, so that it is hardly possible completely to separate bodies by one distillation. This is effected by repeated successive distillations of the liquid with or without the addition of substances to retain the impurities. When the production of one of the ingredients only is aimed at by this process, it is called *rectification*, but when it is desired to separate and collect all the liquids present, or to divide a mixture into portions lying within certain ranges of temperature ascertained either by the thermometer or by the amount of liquor run off, or by the appearance of the distillate, &c., the process is called *fractional distillation*.

In the laboratory, distillation is employed for purifying water, for recovering alcohol and ether, for the preparation, purification, and separation of a great number of bodies. On the large scale distillation is employed in the preparation of potassium, sodium, zinc, mercury; of sulphuric acid, ether, chloroform, sulphide and chloride of carbon, essential oils and perfumes; purification of coal and wood tar, and the products obtained from them, and most extensive of all, the manufacture of spirit.

Each of these requires special appliances which are most conveniently considered in the separate articles. In every case, but especially in that of spirit, great attention is paid to economy of heat. This is effected by making the vapour from a distilling portion heat up an undistilled portion by its condensation.

Destructive distillation differs from the preceding in this respect, that the original substance is not merely separated into the bodies by the mixture of which it is formed, but is so acted on that it is completely decomposed, and bodies are produced which had no existence in the original matter. The term is restricted to the action of heat upon complex organic substances out of contact with the air, and is employed first on account of the destructive action just mentioned, and secondly because the operation is usually conducted in close vessels or retorts, and among the products are liquids which distil over. It is an old process, and upon the results of it chemists, a couple of hundred years ago, based a classification of the elements. Now it is employed on the largest scale, and instead of finding in the products the elements of all things, chemists are constantly discovering new compounds among them.

The products of destructive distillation depend—1st, on the original matter, the products being more numerous the more complex it is; 2dly, on the temperature at which the decomposition is effected; 3dly, on the time the matter is exposed to the heat. In the most general terms they may be described as consisting of gases, such as carbonic anhydride, marsh gas, olefiant gas, and other hydrocarbons; fluids, consisting of water containing ammonia, hydrocarbons, bases; solids, which remain in the retort and consist of carbon, combustible, and ash, incombustible. On the manufacturing scale the process is conducted sometimes for one part, sometimes for another part of the products. Coal, for example, is distilled primarily for the gas, which is used for illumination, but since chemical investigation has shown the value of other parts, such as the ammoniacal water, the benzol, and the anthracene, these are also considered in the operation, and coal may come to be distilled specially for them. Sometimes, again, coal is distilled for the sake of the fixed carbon or coke, and the volatile portions are neglected and practically wasted. Wood is distilled partly for the sake of the pyroligneous acid and the tar, partly for the charcoal. Bones are distilled for the sake of the charcoal, though the oil is also collected. Shale is distilled solely for the sake of the oil. In these cases the gaseous products are not invariably utilized. The preceding are the most important manufactures in which the process is employed, and the products are very numerous, amounting in the case of coal, so far as they have been hitherto examined, to above fifty.

DISTRESS, in law (from the Latin *distringo*, to distrain), is the taking of a personal chattel of a wrong-doer or a tenant, in order to obtain satisfaction for the wrong done, or for rent or service due. The thing taken is also called a *distress*. A distress might be taken for homage, fealty, or any other service, of which there were many descriptions under the old feudal tenures, due from the tenant to the lord, or person of whom the estate was holden, the rendering or payment of which was the consideration or condition on which the land was held. So a distress is, by the English and American law, allowed to be made of cattle or goods *damage-feasant* (which see), both for the purpose of preventing further damage, and obtaining satisfaction for that already done. If the party whose goods or cattle are seized disputes the injury, service, duty, or rent, on account of which the distress is taken, he may replevy the things taken, giving bonds, at the same time, to return them or pay damage in case the party making the distress shows that the wrong has been done, or the service or rent is due, on account of which the distress was taken.

Another description of distress is that of attachment (see ATTACHMENT), to compel a party to appear before a court when summoned for this purpose. The distresses most frequently made in England are on account of *damage-feasance* and rent; though the ordinary attachments on mesne process, that is, on a writ before judgment, that the judgment may be satisfied out of the property so seized, coincides in principle with the right of distress. The reason for giving a right of distress in cases of damage-feasance is obvious, but it is by no means so evident why a landlord should have a right to distrain for his rent any more than a grocer for a debt accruing on account of articles supplied for the use of his debtor's family. As to the things that may be distrained, the English law allows any chattel of the lessee on the premises to be so taken. The law also prescribes particularly the time and mode of making the distress, and the manner of treating the things, especially beasts, distrained.

DISTRICTS, MILITARY. For convenience of organization the whole of the United Kingdom is divided into fourteen military districts, nine of which are in England, and four in Ireland. Scotland forms but one military district. The following are the military districts:—1, The Home district, with its head-quarters in London; 2, The South-eastern, head-quarters, Dover; 3, Chatham, head-quarters, Chatham; 4, Southern, head-quarters, Portsmouth; 5, Western, head-quarters, Devonport; 6, Eastern, head-quarters, Colchester; 7, Northern, head-quarters, Manchester; 8, Woolwich, head-quarters, Woolwich; 9, Aldershot, head-quarters, Aldershot. The head-quarters of the Scotch district are at Edinburgh. The head-quarters of the four Irish districts are at Dublin, Belfast, Curragh, and Cork. The first district comprises the counties of Carlow, Dublin (along with Drogheda town and tower), Galway, Kildare (except Curragh and Newbridge), King's, Leitrim, Longford, Mayo, Meath, Queen's, Roscommon, Sligo, Westmeath, and Wicklow; the second comprises Antrim, Armagh, Cavan, Derry, Donegal, Down, Fermanagh, Louth (except Drogheda), Monaghan, and Tyrone; the third comprises Curragh Camp and Newbridge; and the fourth, the counties of Clare, Cork, Kerry, Kilkenny, Limerick, Tipperary, Waterford, and Wexford.

DITCH, in fortification. See FORTRESS.

DITHYRAMBUS, an epithet of Bacchus, and also a poem sung in honour of the god, at his festivals. Since these festivals were celebrated with all the extravagance which would please the god of wine, the dithyrambus employed in his worship naturally breathed the same frenzy. The character of the dithyrambus therefore requires bold images and lofty periods. The more apparent disorder it contains, the more it partakes of the fire of intoxication, the better it sustains the true dithyrambic character. In the wild Phrygian music it was sung in choirs. Arion of Methymne, on the island of Lesbos, was the first to give a regular choral form to it. Lasos of Hermione is said to have been the first who introduced dithyrambic contests into the public games. The expression *dithyrambic poem* denotes, also, every lyric poem filled with a wild and impetuous enthusiasm, as is the case with many odes of Pindar.

DITMARSH, or DITMARSHES (German, *Dithmarschen*, that is, the German marshes), a district of Holstein, in Germany, consisting of a monotonous flat stretching along the German Ocean, between the mouths of the Elbe and the Eider, and so little raised above the sea as to require the protection of strong embankments. It is divided into the North Ditmarsh, containing eleven, and the South Ditmarsh, containing twelve parishes. The area is 500 square miles, and the total pop. above 70,000.

DITTANY (*Dictamnus*), a genus of plants belonging to the natural order Rutaceæ. The members of this genus are beautiful vivacious plants, with alternate compound imparipinnate leaves. Their flowers are large, and white or purplish in colour; they are arranged in racemes, the peduncles and pedicels of which secrete in numerous more or less prominent glands the essential oil which gives these plants their odour. Their roots were formerly used in medicine, but are no longer so used; their flowers furnish the perfumer with a fragrant distilled water, which is highly esteemed. The most common species is the *Dictamnus fraxinella*, the leaves of which greatly resemble those of the ash (whence its specific name, from the Latin *fraxinus*, an ash-tree). The odoriferous particles which are thrown off from this plant form an inflammable atmosphere around it; and if a lighted candle be brought near the plant, especially in a time of drought, this atmosphere immediately takes fire.

DITTERS VON DITTERSDORF, KARL, a German musical composer, born at Vienna in 1739, is particularly distinguished in comic compositions, and perhaps unrivalled in this branch of music among the German composers. Several of his operas are represented with great applause even in Italy. Doktor and Apotheker; Betrug durch Aberglauben; and Die Liebe im Irrenhause, were among the most successful of these. He also acquired considerable reputation by his oratorio Esther, which secured his elevation to a place among the Austrian nobility. He died in 1799.

DITTO (usually written *do.*) signifies the *aforementioned*, and is a corruption of the Italian *detto*, from the Latin *dictum*, said.

DITTON, HUMPHREY, an English mathematician, born at Salisbury, May 29, 1675; died Oct. 15, 1715. Yielding to the solicitations of his family, he took orders, and for some years exercised the functions of a clergyman at Tunbridge in Kent. On the death of his father he abandoned the church in order to devote himself entirely to the gratification of his taste for mathematics. In doing so he was greatly influenced by Sir Isaac Newton, through whom he received the appointment of mathematical master at Christ's Hospital. This appointment he retained till his death. In 1714, in conjunction with Whiston, he published a new method for finding the longitude at sea, as well as on land. He was besides the author of several mathematical works, the principal of which are the following:—General Laws and Nature of Motion (1705); Institution of Fluxions (1706); Treatise on Perspective, Demonstrative and Practical, (1712); New Law of Fluids (1714). He also wrote a Discourse concerning the Resurrection of Jesus Christ (1712), which was afterwards translated into several languages.

DIU, an island of Hindustan, belonging to the Portuguese, off the south extremity of Gujerat, from which it is separated by a very narrow channel, about lat. 20° 43′ N.; lon. 71° 6′ E. It is 7 miles in length, east and west, stretching parallel to the coast, of which it seems a part. On a point on the east end of the island stands the town of Diu, well fortified and surrounded by a wall with towers at regular distances. Although the island appears unfit for cultivation the market is well supplied with provisions from the mainland. The water is brackish, but large quantities are collected and stored for drinking during the rainy season. Pop. 12,000. Diu came into the possession of the Portuguese in 1515. It was formerly the seat of a considerable commerce, but is now a place of no importance.

DIURETICS, medicines intended to increase the secretion and discharge of urine. Their mode of action is not well known, and there is a very important physiological distinction in regard to them. Whenever, from any cause, perspiration is diminished, the urinary discharge is increased, and hence the marked differences observed in cold and in warm weather. Obviously, therefore, baths and acidulated drinks, by diminishing perspiration, have the effect of diuretics, though in regard to the urinary organs they are relaxing and antiphlogistic. Other diuretics which act more directly in producing secretion merely are cantharides and certain resins and balsams; but more poweful diuretics, which act more generally on the system and tend to carry a larger proportion of its fluids to the urinary canal, are nitrate of potash, uric acid, squill, digitalis, colchicum, dandelion, linseed, &c. From this tendency to change the direction of the fluids diuretics are often of essential service in dropsy and similar affections.

DIURNA. See BUTTERFLY.

DIURNAL, in the Roman Catholic Church, a book containing the canonical hours of the breviary for each day.

DIVAN.—1. With the Turks, the highest council of state: the Turkish ministry. Every pasha has also a divan.

2. In the large mansions of the rich in Turkey a divan signifies a large hall for the reception of visitors, which communicates with a number of antechambers surrounding it, and which contains sofas placed round the walls, often adorned with costly tapestry and richly embroidered cushions.

3. *Divan*, with the Arabs, Persians, and Turks, is used to denote a complete collection of lyric poems, which they called *gazelles*, and through each of which one single rhyme extends: they never exceed the length of fourteen strophes. Such a collection is complete if there are as many divisions as there are letters in the alphabet of the respective languages; and each division contains at least one poem, the rhymes of which terminate with the letter under which the division falls; some letters are excluded, as few or no words end in them. Goethe applied this name to a collection of poems by himself, written in the eastern fashion.

4. In Europe the word is applied to a soft cushioned seat for the accommodation of several persons, which is distinguished from a sofa by having neither arms nor back.

DIVER (*Colymbus*), a genus of aquatic birds common to both Europe and America. The great northern diver (*C. glacialis*), in the United States called the loon, is found on the coasts of Britain. In America they are most numerous about Hudson's Bay, but are also found farther south. In Pennsylvania they are migratory, making their appearance in the autumn. They are commonly seen in pairs, and procure their food, which is fish, by diving and continuing under water for a length of time. They are very wary, and are seldom killed, eluding their pursuers by their great dexterity in plunging beneath the water. They are very restless before a storm, always indicating its approach by the utterance of loud cries. They are not eaten, the flesh being rank and fishy. Some of the tribes in the Russian Empire tan the skin which covers the breast of this fowl, and form dresses, &c., of it, which are very warm, and imbibe no moisture. The Greenlanders also make the same use of them. The great northern diver measures nearly 3 feet from the tip of the bill to the end of the tail, and about 5 feet across the wings: the bill is strong, of a glossy black, and 4¾ inches long, to the corner of the mouth. The head and half of the length of the neck are of a deep black, with a green gloss and purple reflections; this is succeeded by a band consisting of interrupted white and black lateral stripes, which encompasses the neck, and tapers to a point on its fore part, without joining; below this is a broad band of dark glossy green and violet, which is blended behind with the plumage of the back; the whole of the upper parts are of a deep black, slightly glossed with green, and thickly spotted with white, in regular transverse or semicircular rows, two spots on the end of each feather; the lower parts are pure white, with a slight dusky line across the vent. The outside of the legs and feet is black, the inside lead colour. The leg is 4 inches in length; both legs and feet are marked with five-sided polygons; weight about 8 to 10 lbs. The female lays two large brownish eggs, and generally builds at the edge of small islands or the margins of lakes and ponds. In swimming and diving the legs only are used, and not the wings, as in the guillemot and auk tribes; and from their being situated far behind, and their slight deviation from the line of the body, the bird is enabled to propel itself through the water

with great velocity. The black-throated diver (*Colymbus arcticus*) is rather smaller than the great northern diver. The top of the head is of an ashen-gray colour; the back and the rump are black; the scapulars and coverts of the wings thickly spotted with white; the throat black; the front and sides of the neck white, with black spots; all the under parts are pure white. It is similar in its habits to the great northern diver. It is only a rare visitant on our shores. The red-throated diver (*Colymbus septentrionalis*) is the smallest of the divers, being from 2 feet to 2 feet 2 inches in length. The throat, the sides of the head, and neck are of a gray colour; the top of the head spotted with black; the front of the neck of a bright chestnut-brown or reddish colour. It is found in the arctic seas, and builds its nest on the islands on the coast of Norway, as well as in Orkney and Shetland, and some of the Hebrides. It is occasionally seen in the estuary of the Thames.

DIVERGENT, tending to various parts from one point; thus we say divergent lines, rays, &c., meaning those lines or rays which, issuing from one common point, go off from that point in various directions. Concave lenses render the rays divergent, and convex ones convergent. Concave mirrors make the rays converge, and convex ones make them diverge.

DIVERGING SERIES, in analysis, are those series the terms of which increase more and more the further they are continued.

DIVERSION, in military affairs, is an attack on an enemy in a place where he is weak and unprovided, in order to draw off his forces from another place where they have made, or intend to make, an irruption.

DIVIDEND, as a mercantile term, is the interest or profit of stocks divided among, and paid to, the proprietors. It also signifies the payment made to creditors out of the estate of a bankrupt.

Dividend, in arithmetic, is that number which is to be divided.

DIVI-DIVI, LIBI-DIBI, or LIBI-DAVI, the bean-pods of *Cæsalpinia coriaria*, a tree which grows in Maracaibo in South America, in the Antilles, and in Mexico, and a member of the family which yields sapan, brazil, and other red woods. The pods are about 1 inch broad and 3 inches long, but are generally bent or curled up, and tend to scale off on the outside. They have a pale-brown colour with a tinge of yellow; sometimes they are spotted and black, and then they are not so good. They are very rich in tannin (especially in the pod), good samples containing as much as 40 to 50 per cent., and form one of the best materials for tanning. They are also largely used in calico-printing for blacks and dark shades. the aqueous extract being preferred for the purpose, as the solid parts are apt to stick to the cloth and prevent the dye being uniform.

DIVINATION (from the Latin *divinatio*), the foreseeing or predicting of future events (in Greek, *manteia, mantikē*). Cicero has treated this subject in his book De Divinatione. Man is so dependent upon external things and influences, he is so conscious of this influence, he is so perfectly aware of the uncertain issue of his best calculations, and is so often obliged to act when the reasons for and against a measure seem to be almost equally balanced, that it is natural for him to cherish an ardent desire to pry into futurity, and to inform himself about things which are happening in distant regions, by some process out of the ordinary course of nature. If we take into view, besides this natural desire, the belief which all men of religious sentiments naturally entertain of the immediate dispensations of Providence, of a constant interference of the Deity in the course of things, notwithstanding the existence of eternal and all-wise laws, we shall have the reason why belief in divination of some kind or other, in signs given from above to warn or to alarm, and in the power of particular individuals to lift the veil of futurity, has been so general.

We need not suppose divination to have had its origin in fraud: the disposition of men to deceive themselves, and form conclusions as to future events from unmeaning signs, will sufficiently account for its existence. In the sequel, indeed, it became a fruitful source of imposition. Moses prohibited divination expressly (Deut. xviii. 11). Saul expelled 'those that had familiar spirits, and the wizards,' from his kingdom; yet he was weak enough to consult the famous witch of Endor shortly before the decisive battle in which he fell. The Egyptians and Greeks had their oracles. With the Romans divination and witchcraft were brought into a kind of system, and constituted part of their religion, of which the generals and chiefs of parties often availed themselves with much effect. (See AUGURS and ARUSPICES.) The ancient Germans had consecrated white horses, from whose snorting and neighing they drew favourable or unfavourable signs. They also followed the guidance of prophetesses, whom they called *Alrunes*. Many Christians, from the period of the third century, adopted the *sortes biblicæ* or *sortes sanctorum*—a mode of judging of the future by opening the Sacred Scriptures at random, and forming an opinion from the passage on which the eye happened to fall. (See BIBLIOMANCY.) In early times Virgil's Æneid was also used for the same purpose (*sortes Virgilianæ*). This usage of the Bible was early disapproved by the councils. Some popes forbade it under penalty of excommunication. The Capitularies of Charlemagne also prohibit this mode of consulting the Psalms and the Gospels; yet the *sortes biblicæ* continued until the fourteenth century, and are not even now altogether obsolete. All the ancient Asiatic tribes had modes of divination; and sorcerers are common among the Indians of America. In fact we believe that there has hardly been a nation discovered, which had advanced beyond the lowest barbarism, that did not practise some kind of divination; and even in the ages in which reason has most prevailed over feeling, the belief in the power of foreseeing future events has been entertained; even men of the greatest intelligence have not been able to rid themselves of it entirely.

In most countries of Europe many of the old forms of divination continue to be practised, sometimes from superstition, sometimes for amusement. In fact the love of having one's fortune told is not confined to the ignorant and the superstitious. People who are above believing the predictions are still fond of prying, in sport, into the mysteries of futurity. There are many names for the different modes of prognosticating the future by means of the various appearances which nature and art present, from the revolutions of the stars down to the grounds of a coffee-cup. The following names by no means exhaust the list, which would be difficult, as the different modes of divination that have been practised are almost endless:—*Aëromancy*, divination by air; *aleuromancy*, by flour; *arithmomancy*, by numbers; *axinomancy*, by axes; *belomancy*, by arrows; *bibliomancy*, by the Bible; *capnomancy*, by smoke; *catoptromancy*, by mirrors; *cleidomancy*, by keys; *ciromancy*, by wax; *coscinomancy*, by sieves; *dactylomancy*, by the fingers; *geomancy*, by the earth; *hepatoscopy*, by the liver of animals; *hydromancy*, by water; *lampadomancy*, by lamps; *myomancy*, by the muscles; *necromancy*, by corpses; *nephelomancy*, by clouds; *oneiromancy*, by dreams; *pyromancy*, by fire; *rhabdomancy*, by rods;

xylomancy, by wood. Some of the more important of these have separate articles devoted to them. It has been often observed that great politicians, men who have risen above many of the prejudices of their age, and have even disregarded important truths, have yet given themselves up to a superstitious trust in signs and divination. The works on this subject are very numerous, including as they do the mystical productions of the East, the Cabala (which see), the treatises on astrology, witchcraft, &c., in the middle ages, and all that modern times have produced, as Jung Stilling's Theorie der Geisterkunde (Theory of Demonology), Sir W. Scott's History of Demonology, &c.

DIVINE RIGHT, the doctrine that the right of sovereigns to rule is derived immediately from the Deity, whose representatives they are, and that accordingly they are not responsible to their subjects for their method of governing, nor to any other human court of appeal. This was the doctrine to which the Stuarts were so much attached, and which was taught almost universally by the clergy of the Church of England and in the universities after the Restoration. Even the tyranny of James II. was not enough to induce the English clergy to renounce this favourite doctrine, and after the Revolution about 400 of them, including some of the bishops, sacrificed their benefices rather than deny

'The right divine of kings to govern wrong.'

After this time the theory of divine right and passive obedience has been little more heard of in this country at least.

DIVINE SERVICE, TENURE BY, a species of tenure, now obsolete, by which the tenant held the land on condition of performing some divine service, such as saying so many masses, distributing a certain amount in alms, &c.

DIVING. Diving without the aid of some artificial means to supply the diver with air under water is now rarely practised (unless for amusement) except in sponge, coral, and pearl fishing, and sometimes for recovering treasure from wrecked vessels. The best divers are able to remain about one minute and a third under water, and only in extreme and exceptional cases as long as two minutes. Instances are recorded of divers remaining four, five, and even six minutes under water, but these are of questionable authenticity. It need scarcely be said that the statements that are sometimes to be met with to the effect that the Ceylon pearl-divers sometimes remain fifteen or twenty minutes under water are mere extravagant fictions. An interesting fact is related with regard to the engineer Brunel, the designer of the Thames Tunnel, which shows that it is possible to remain longer under water when the lungs are filled with compressed air than when filled with air of the ordinary density. On one occasion he descended in a diving-bell to examine a break that had taken place in the tunnel, but found that when he had got to a certain depth the break was not large enough to allow the diving-bell to descend further. Accordingly, taking hold of a rope he dived deeper into the water, and it is stated that he could remain fully two minutes under water without any difficulty. As this would be a long period even for the most expert diver the facility with which he accomplished this can only be accounted for by the fact that the air which he inhaled was subjected to a pressure of about 30 feet of water, which is nearly equal to an additional atmosphere. The air was accordingly compressed to about half its bulk, so that his lungs when filled with it really contained twice the amount of air that they would have been able to admit in ordinary circumstances. The number of times that a diver will go under water in a single day is not more than thirty or forty. The means taken to descend is to lay hold of a rope with one hand, and to insert the foot in a loop made in another rope to which a stone is attached, with which the diver sinks to the bottom.

To enable divers to remain for a considerable time (sometimes five or six hours) under water a diving dress (Pl. XLII. fig. 4) is used, which is so contrived that the diver is constantly supplied with air from above, while he is kept perfectly dry. It consists of a waterproof dress which covers the entire body except the head, the covering for which is a metal helmet, G, which comes pretty far down on the breast and back, where it is rivetted to the diver's waterproof jacket so tightly that no water is admitted. The helmet has three eyeholes, D, in front, covered with glass, and protected by brass wire. Air is supplied by means of a flexible tube, A, which enters the helmet and communicates with an air-pump, and to prevent the glasses in front from becoming dimmed by the breath of the diver the fresh air in entering the helmet is directed against them. To allow of the escape of the used air there is another flexible tube which is led from the back part of the helmet to the surface of the water. Before descending the diver fastens a leather belt round the neck of the helmet, to which are attached two heavy weights, one before, C, and one behind, to enable him to descend with facility, and to steady him in walking under water. For the same purpose he has heavy weights attached to his feet also. There is a signal line, B, attached at H to the diving dress, by which the diver communicates with the attendants, and he carries another line in his hand to guide him in returning to the rope or ladder by which he descends.

DIVING-BELL. To illustrate the principle of this machine take a glass tumbler, plunge it into water with the mouth perpendicularly downwards: it will be found that very little water will rise into the tumbler, which will be evident if a piece of cork be laid upon the surface of the water, and the tumbler put over it; for it will be seen that, though the cork should be carried far below the surface of the water, yet its upper side is not wetted, the air which was in the tumbler having prevented the entrance of the water; but as air is compressible, it could not entirely exclude the water, which by its pressure condensed the air a little.

The first diving-bell we read of in Europe was tried at Cadiz by two Greeks in the presence of Charles V. and 10,000 spectators. It resembled a large kettle inverted. The first of any note was made by Dr. Halley. It is most commonly made in the form of a truncated cone, the smaller end being closed, and the larger one open. It is so suspended that it may sink full of air, with its open base downwards, and as near as may be parallel to the horizon, so as to close with the surface of the water. Smeaton's diving-bell, made in 1788, was a square chest of cast iron, 4½ feet in height, 4½ feet in length, and 3 feet wide, and afforded room for two men to work in it. It was supplied with fresh air by a forcing-pump. This was used with great success at Ramsgate. Other contrivances have been used for diving-bells.

In Pl. XLII. we have given various views of a diving-bell used on the river Clyde. Fig. 1 is a sectional side elevation of the machine. A is an iron chest open at the bottom but covered at the top, G. Over the top is fastened a casing, either of wood, or, what seems to be preferable, of sheet iron. This casing is employed as a sort of coffer-dam in order that the water above the bell may be displaced so that more light may be admitted from above into the bell. A section of the bell on a larger scale is shown in figure 3, where the seats are seen projecting from the sides near the bottom. On these seats the divers

stand, but when any of them wish to go to the bottom they step upon a projecting piece seen in the centre near to the mouth of the bell. The lower portion of this figure shows a ground view of the top of the bell, *a a*, which is crossed by a strong iron bar and contains eight round holes, into which glass lenses are fitted for the transmission of light. To the upper side of this top is attached (in a manner which will be easily understood by inspection of the figure) the chain which passes over the pulley, *b b*, and is wrought by the crane, *c*, by which arrangement the bell may be either raised or depressed at pleasure. The bell, as will be seen in fig. 1, passes through an opening in the barge, but where the apparatus is to be used in very deep water a better arrangement would be to suspend the bell from the end of the barge, which would increase the quantity of light admitted into the bell. From the top of the bell there proceeds a hose or leather pipe, which is led up to the deck, where it communicates with two forcing-pumps, by which means fresh air is constantly issued into the bell, which air by its pressure displaces the water in the cavity, A, and allows the divers to carry on their operations. The bell has four sides, being somewhat larger at the bottom than the top, and the metal being thicker towards the mouth, in order to counteract any tendency that the bell might have to overset. The area of the bell at the mouth is 5 feet 7 inches by 3 feet 9 inches, and at the top 5 feet 2 inches by 3 feet 7½ inches; the height of the top above the mouth is about 6 feet. To the top is attached a strong ring, G, to which the tackling used for lifting stones is attached when these are lifted in the bell; but sometimes these are taken up through an opening at the one side of the bell, as may be seen in fig. 1; and in order that these should pass easily up there is a hook on the right hand side of the bell, and near the bottom, by which the bell may be drawn aside, in order that more space may be left for raising the stones. These stones are raised by a crane, which may be seen at *w*, in the end elevation, fig. 2, the tackling of which passes over the framework above. At *e* is seen the crane which raises or depresses the bell, and at K the pumping apparatus. To the framework is attached a signal ball, *n*, which is raised when the bell is under water to warn the masters of steam vessels to stop the engine before they approach the barge so that the divers may not be interrupted by the agitation of the water.

A diving-bell of the construction just described is open to the objection of not being easily moved about, as it is not at the command of the occupants, but of the attendants above, who have to be directed by signals from the workmen in the bell. A most ingenious kind of diving-bell, called a *nautilus*, has been invented, which is not open to this objection, but which is entirely at the command of the occupants, who can make it sink or swim, and move it about at pleasure, and can use it at the same time to raise great weights and convey them to any desired spot. A diving-bell of this nature was found of great service in the constructing of some parts of the Victoria Docks, London, and in some works on the Seine. It consists of a chamber narrower at the bottom than at the top, and with a strong arched roof. The side-walls of the chamber are double, and the spaces left between the walls may be brought into communication with the water outside by means of a pipe at the bottom of the diving-bell, and also with a receiver, which supplies the diving-bell with air by means of another pipe placed at the top. On each of these pipes there is a stop-cock, which allows the communication to be established either with the external water or with the receiver according to the pleasure of the workmen. The working chamber of the machine may also be brought into communication with the receiver by means of a branch cock on the top pipe. The diving-bell is entered by a manhole at the top, which is tightly shut after the workmen have entered. At the bottom of the machine there is another hole by which the workmen go out to perform any work required. This hole also is kept tightly covered with a lid until it is necessary to open it. When the compartments in the walls of the diving-bell are filled with air the machine is lighter than an equal bulk of water, and accordingly it floats; but when they are filled with water the machine is heavier than an equal bulk of water, and therefore sinks. This being the case, it is evident that when the workmen have entered the machine and wish to descend all that they have to do is to admit the water into the compartments between the walls of the machine. Before this is done, however, the receiver must be charged with air at such a density that the pressure on the square inch is rather greater than the corresponding pressure of the water at the depth which the divers desire to reach. The stop-cock on the bottom pipe is then opened, and another at the top of the side compartments, to allow of the escape of the air they contain; and sufficient water is admitted into the side compartments to bring the machine fairly under water, when the stop-cock is again shut, and the machine allowed to descend gradually. On reaching the bottom the stop-cock which establishes the connection between the working chamber of the machine and the receiver is opened, and air is admitted until it has reached such a density that the force exerted by it is exactly equal to the resistance of the water outside, which is shown by a gauge affixed to the side of the working chamber. The lid which covers the hole in the bottom may then be taken off, when of course the water outside the diving-bell, and the air within, will be found to be in perfect equilibrium, and no water will enter. If the descent of the machine has taken place at a spot where there are no currents, the machine will remain stationary as long as the workmen desire it, and when they wish to move it they have merely to get out at the bottom hole and push it in any direction they please. But if there are currents at the place the machine is held fast by cables, which pass up through stuffing-boxes in the working chamber, and over swinging pulleys placed, in order to secure steadiness, in the plane of the centre of gravity of the machine, and are then attached to eye-bolts fixed in some secure place. When the workmen wish to ascend, all that is necessary is to admit air from the receiver into the side compartments, and to open the communications with the water outside. For as the air in the receiver exerts a greater pressure than the water at the depth of the machine, the result is that some of the water must be expelled, and the machine must therefore become lighter and rise. The upward tendency that the machine has in these circumstances is applied to the raising of weights by means of an apparatus at the bottom of the machine to which the weights (heavy stones, &c.) may be attached; and when they are attached condensed air is admitted to the compartments, and water expelled until the specific gravity of the machine with the weight attached to it is exactly equal to that of the surrounding water. When this is attained the nautilus with the weight may be moved about as the workmen please. For a long time there was one difficulty to be overcome in performing this operation which rendered the nautilus quite unmanageable. While being used to lift a weight the machine is open at the bottom, and the air of the working chamber is in free contact with the water. In

the original form of the machine the result was that if the gravity of the machine and weight combined was reduced so much that they weighed somewhat less than water of the same bulk, however little the difference in weight might be, they began to rise, and the equilibrium between the air inside and the water outside being thus destroyed, the machine continued to rise at a constantly accelerating rate; for every inch that the machine rose the resistance of the water became less, and in the same proportion the expansive power of the air inside was more strongly manifested in forcing the machine upwards. The contrivance by which this difficulty has been obviated is equally simple and ingenious. An arrangement of channels slightly inclined and communicating freely with the outside of the machine is placed at the bottom, so that as soon as the air in the working chamber expands so much as to reach these channels it escapes to the outside. It has thus no effect whatever in disturbing the equilibrium of the machine, the ascent and descent of which are regulated by the air in the side compartments, where the expansive power of the air does not get leave to act, as the communication between these compartments and the external water can be closed at pleasure.

DIVING-DRESS. See DIVING.

DIVINING ROD. See RHABDOMANCY.

DIVISIBILITY. The actual subdivision of bodies has, in many cases, been carried to a prodigious extent. A slip of ivory, of an inch in length, is frequently divided into a hundred equal parts, which are distinctly visible. But by the application of a very fine screw, 5000 equidistant lines, in the space of a quarter of an inch, can be traced on a surface of steel or glass with the fine point of a diamond, producing delicate iridescent colours. Common writing-paper has a thickness of about the 500th part of an inch; but the pellicle separated from ox-gut, and then doubled to form gold-beaters' skin, is six times thinner. A single pound of cotton has been spun into a thread 76 miles in length; and the same quantity of wool has been extended into a thread of 95 miles; the diameters of those threads being hence only the 350th and 400th parts of an inch.

But the ductility of some metals far exceeds that of any other substance. The gold-beaters begin with a ribbon an inch broad and 150 inches long, which has been reduced, by passing through rollers, to about the 800th part of an inch in thickness. This ribbon is cut into squares, which are disposed between leaves of vellum, and beat by a heavy hammer, till they acquire a breadth of more than 3 inches, and are therefore extended ten times. These are again quartered, and placed between the folds of gold-beaters' skin, and stretched out, by the operation of a lighter hammer, to the breadth of 5 inches. The same process is repeated, sometimes more than once, by a succession of lighter hammers; so that 376 grains of gold are thus finally extended into 2000 leaves of 3·3 inches square, making in all eighty books, containing each twenty-five leaves. The metal is, consequently, reduced to the thinness of the 282,000th part of an inch, and every leaf weighs rather less than the 5th part of a grain. Silver is likewise capable of being laminated, but will scarcely bear an extension above half that of gold, or the 150,000th part of an inch thick. Copper and tin have still inferior degrees of ductility, and cannot, perhaps, be beat thinner than the 20,000th part of an inch. These form what is called *Dutch leaf*.

In the gilding of buttons, 5 grains of gold, which is applied as an amalgam with mercury, is allowed to each gross; so that the coating left must amount to the 110,000th part of an inch in thickness. If a piece of ivory or white satin be immersed in a nitromuriate solution of gold, and then plunged into a jar of hydrogen gas, it will become covered with a surface of gold hardly exceeding in thickness the 10,000,000th part of an inch. The gilt wire used in embroidery is formed by extending gold over a surface of silver. A silver rod, about 2 feet long and 1½ inch in diameter, and therefore weighing nearly 20 lbs., is richly coated with about 800 grains of pure gold. In England the lowest proportion allowed is 100 grains of gold to a pound of silver. This gilt rod is then drawn through a series of diminishing holes, till it has stretched to the vast length of 240 miles, when the gold has, consequently, become attenuated eight hundred times, each grain covering a surface of 9600 square inches. This wire being now flattened, the golden film suffers a further extension, and has its thickness reduced to the 4,000,000th or 5,000,000th part of an inch.

It has been asserted that wires of pure gold can be drawn of only the 4000th part of an inch in diameter. But Dr. Wollaston, by an ingenious invention, obtained wires of platinum much finer than this. Taking a short cylinder of silver, about the third part of an inch in diameter, he drilled a fine hole through its axis, and inserted a wire of platinum only the 100th part of an inch thick. This silver mould was now drawn through the successive holes of a steel plate, till its diameter was brought to near the 1500th part of an inch, and consequently the internal wire, being diminished in the same proportion, was reduced to between the 4000th and 5000th part of an inch. The compound wire was then dipped in warm nitric acid, which dissolved the silver, and left its core, or the wire of platinum. By passing the incrusted platinum through a greater number of holes, wires still finer were obtained, some of them only the 30,000th part of an inch in diameter. The tenacity of the metal, before reaching that limit was considerable; a platinum wire of the 18,000th part of an inch in diameter supporting the weight of one grain and a third.

Such successive fineness is hardly surpassed by the filamentous productions of nature. Human hair varies in thickness from the 250th to the 600th part of an inch. The fibre of the coarsest wool is about the 500th part of an inch in diameter, and that of the finest only the 1500th part. The silk line, as spun by the worm, is about the 5000th part of an inch thick; but a spider's line is perhaps six times finer, or only the 30,000th part of an inch in diameter; insomuch that a single pound of this attenuated substance might be sufficient to encompass our globe. The red globules of the human blood have an irregular, roundish shape, from the 2500th to the 3300th of an inch in diameter, with a dark central spot.

The trituration and levigation of powders, and the perennial abrasion and waste of the surface of solid bodies, occasion a disintegration of particles almost exceeding the powers of computation. Emery, after it has been ground, is thrown into a vat filled with water, and the fineness of the powder is distinguished by the time of its subsidence. In very dry situations the dust lodged near the corners and crevices of ancient buildings is, by the continual agitation of the air, made to give a glossy polish to the interior side of the pillars and the less prominent parts of those venerable remains. So fine is the sand on the adust plains of Arabia, that it is carried sometimes 300 miles over the Mediterranean by the sweeping sirocco. The marble steps of the great churches in Italy are worn by the incessant crawling of abject devotees; nay, the hands and feet of bronze statues

are, in the lapse of ages, wasted away by the ardent kisses of innumerable pilgrims that resort to those shrines. What an evanescent pellicle of the metal must be abraded at each successive contact!

The solutions of certain saline bodies, and of other coloured substances, exhibit a prodigious subdivision and dissemination of matter. A single grain of the sulphate of copper, or blue vitriol, will communicate a fine azure tint to 5 gallons of water. In this case the sulphate must be attenuated at least 10,000,000 times, yet each drop of the liquid may contain as many coloured particles. A still minuter portion of cochineal, dissolved in deliquiate potash, will strike a bright purple colour through an equal mass of water.

Odours are capable of a much wider diffusion. A single grain of musk has been known to perfume a large room for the space of twenty years. Consider how often, during that time, the air of the apartment must have been renewed and have become charged with fresh odour! At the lowest computation the musk had been subdivided into 320 quadrillions of particles, each of them capable of affecting the olfactory organs. The vast diffusion of odorous effluvia may be conceived from the fact that a lump of assafœtida, exposed to the open air, lost only a grain in seven weeks. The vapour of pestilence conveys its poison in a still more subtle and attenuated form. The seeds of contagion are known to lurk for years in various absorbent substances, which scatter death on exposure to the air.

Animated matter likewise exhibits in many instances a wonderful subdivision. The milt of a codfish, when it begins to putrefy, has been computed to contain a billion of perfect insects; so that thousands of these living creatures could be lifted on the point of a needle. But the infusory animalcules display, in their structure and functions, the most transcendent attenuation of matter. The *Vibrio undula*, found in duck-weed, is computed to be 10,000 million times smaller than a hemp-seed. The *Vibrio lineola* occurs in vegetable infusions, every drop containing myriads of those oblong points. Of the *Monas gelatinosa*, discovered in ditch water, millions appear in the field of a microscope, playing like the sunbeams in a single drop of liquid. Insects have been discovered so small as not to exceed the 10,000th part of an inch, so that 1,000,000,000,000 of them might be contained within the space of 1 cubic inch; yet each animalcule must consist of parts connected with each other, with vessels, with fluids, and with organs necessary for its motions, for its increase, for its propagation, &c. How inconceivably small must those organs be! and yet they are, unquestionably, composed of other parts still smaller, and still farther removed from the perception of our senses.

DIVISION, in military matters, a portion of an army under one general officer. In the navy, a select number of ships in a fleet or squadron of men-of-war, distinguished by a particular flag, pendant, or vane. A squadron may be ranged in two or three divisions, the commanding officer of which is always stationed in the centre. A fleet is divided into three squadrons, each of which is commanded by an admiral, and is again divided into divisions.

DIVISION OF LABOUR, a principle employed in great industries for the simplification of the work to be done by each of the workmen engaged in it. The separation of complicated processes into a series of simple operations not only results in a great saving of time, but also demands much less ability on the part of the workman, in order that he may acquire the necessary skill in performing any particular operation. Even children are able to attain a degree of adroitness in performing a single operation, which is absolutely unattainable by a person who is required to perform several. The body is accustomed to repeat the same movements with perfect exactness, and the senses themselves become sharpened and improved by continued practice. For instance, children employed in making the 'eyes' of needles acquire so much quickness of sight and expertness of hand that they can strike a hole in the end of a hair and draw the other end through it. Owing to both of these causes, the saving of time, and the employment of cheaper labour, the cost of producing complicated articles is, by the application of this principle, immensely reduced. On the other hand, the continual repetition of one and the same operation has an unmistakably deteriorating effect upon the persons so engaged; a man finds himself converted into a mere mechanical instrument. This degradation of the human labourer, however, has now found a limit in the more advantageous employment of machinery. Whenever any operation has been simplified to such a degree that the assistance of an intelligent person is no longer required in the performance of it, it has reached a point at which human labour will, sooner or later, inevitably be supplanted by machinery, if only there is a sufficient demand for the manufactured product to make it worth while to employ machinery.

DIVITIACUS, a chief of the Ædui, often mentioned in the Commentaries of Cæsar. He was a constant adherent of the Romans, and on one occasion made a visit to Rome, where he became the guest of Cicero, who mentions him in his book De Divinatione as belonging to the order of the Druids, and professing much knowledge of the mysteries of nature and art of divination.

DIVORCE is a separation, by law, of husband and wife, and is either a divorce *a vinculo matrimonii*, that is, a complete dissolution of the marriage bonds, whereby the parties become as entirely disconnected as those who have not been joined in wedlock, or a divorce *a mensâ et thoro* (from bed and board), whereby the parties are legally separated, but not unmarried. The causes admitted by different codes of laws as grounds for the modification or entire dissolution of the marriage contract, as well as the description of tribunal which has jurisdiction of the proceedings, and the form of the proceedings, are various.

According to the law of Moses (Deut. xxiv. 1), 'when a man hath taken a wife and married her, and it come to pass that she find no favour in his eyes, because he hath found some uncleanness in her; then let him write her a bill of divorcement, and give it in her hand, and send her out of his house.' This was a very summary proceeding, and the provision seems scarcely to recognize the force of a marriage contract as binding upon the husband, who, according to the prevalent interpretation of this law among the Jews, might be his own judge of the sufficiency of the cause for repudiating his wife; and one school of doctors, whose interpretations were held in respect, considered it to be sufficient cause if he preferred another woman, or if his wife did not dress his victuals to his satisfaction. This law is said (Matt. xix. 8) to have been a concession to the hardness of heart of the Jews, who were not prepared to receive a better doctrine. The wife, on receiving her bill of divorce, was at liberty to marry again after waiting ninety days, in order to avoid doubts as to the paternity of her next-born child. This law, like those of the eastern countries generally, pays very little respect to the rights of the wife, as a party to a matrimonial contract. The husband might marry another wife immediately. The wife could not divorce the husband.

The Mohammedan law of divorce, founded upon

some passages in the Koran, allows of a separation by mutual consent, giving the wife the right of retaining her marriage portion, unless she agrees to relinquish a part of it as the price of the separation. The parties are permitted to separate and reunite twice, if they can so agree without any particular conditions; but after the third divorce the husband is not permitted to receive his wife again until she shall have previously married another husband. The act of divorce is a judicial proceeding before the cadi, who does not decree it until three months after the application, which delay is made in order to determine whether the wife is pregnant; and if she be so, the divorce is delayed until after her delivery. The magistrates throw obstacles in the way of divorce, so that the expenses of the proceedings, and the necessity of allowing the wife her marriage portion back again in case of divorce, sometimes discourage the husband from prosecuting the affair, and induce him to make a composition. But here, according to D'Arvieux's Memoirs, the magistrate interposes, and will not permit a reconciliation and discontinuance of the proceedings, until the wife is first married to another person; for which purpose some youth is agreed with to act the part of second husband, so far as may be necessary in order to afford a ground for the discontinuance of the proceedings, and the relenting husband must be a spectator of this second marriage and its incidents. A cadi informed this traveller that this condition was rigidly enforced, in order to prevent the tribunals from being overburdened with applications for divorce.

The Hindu laws pay still less respect to the women, who are considered very much in the light of slaves to their husbands. According to a maxim of these laws, 'prudent husbands instantly forsake a wife who speaks unkindly.' Barrenness, the bearing of daughters only, eating in her husband's presence, any incurable disease, and quarrelsomeness, are each a sufficient cause of divorce. The same law inculcates upon the wife the obligation to revere her husband as a god, although he is devoid of all good qualities, or enamoured of another woman. If the wife is superseded by the husband's taking another, he must still maintain her.

The Chinese laws of divorce are very similar to the Hindu, but add some other sufficient causes, such as disregard to the husband's parents, loquaciousness, and jealousy of temper. But the husband cannot divorce a wife who has mourned three years for his parents, or if his family has become rich subsequently to his marriage, or if the wife have no parents living to receive her back again. A woman who has been deserted three years by her husband may marry another.

The different Grecian states had each their respective laws of divorce. At Sparta they do not seem to have greatly regarded the delicacy of the marriage bed when the interest of the republic was in question; but divorces appear to have been rare, since the *ephori* fined Lysander for repudiating his wife. At Athens either the husband or wife might procure a divorce by exhibiting a bill for this purpose to the archon, and obtaining the verdict or consent of a jury to whom the question was referred. But the party applying must, it seems, have made application personally; and Alcibiades, according to Plutarch, took advantage of his authority as a husband to prevent his wife from making the application personally; for when she was going from her brother's house, where she had taken refuge, to the archon's to sue for a divorce, he forcibly seized upon her, and confined her to his own house.

The early laws of Rome permitted the husband to divorce his wife for poisoning his children, counterfeiting his keys, or adultery. But other causes were afterwards added; for the first divorce recorded was for the sterility of the wife. This was by Sp. Carilius Ruga, about 230 B.C. Divorces afterwards became very frequent, and a law was, on this account, made by Augustus, requiring additional ceremonies in a divorce; among other things, the presence of seven witnesses to the act of dissolution of the marriage. By the Theodosian code the husband could divorce the wife for adultery, or if she was a witch or a murderess, had sold a freeborn person into slavery, violated a sepulchre, committed sacrilege, been accessory to theft or robbery, was given to feasting with strangers without the knowledge or against the wishes of the husband, lodged abroad without good reason, or frequented theatres and shows, her husband forbidding, or was aiding and abetting in plots against the state, or dealt falsely, or offered blows. The wife had equivalent rights in this respect, for she could procure a divorce on similar charges against her husband. He could be married again immediately; she, not within a year.

The facility of divorce continued, without restriction, under the Roman emperors, but as the modern nations of Europe emerged from the ruins of the Roman Empire, they adopted the doctrine of the New Testament (Matt. xix. 6), 'What God hath joined together, let not man put asunder.' Marriage, under the Roman Church, instead of a civil contract, came to be considered a sacrament of the church, which it was unlawful to dissolve. The ecclesiastical courts could indeed annul a marriage, but only for a cause that existed at the time the marriage was contracted, such as prior contracts, impotency, &c. For any cause arising after marriage they could only pronounce a divorce *a mensâ et thoro*, which did not leave either party free to marry again. A divorce *a vinculo matrimonii*, for any cause arising subsequent to marriage, could formerly be obtained in England only by an act of Parliament, and the ecclesiastical courts must have previously pronounced a divorce *a mensâ et thoro*. By the act 20 and 21 Vict. cap. lxxxv. (Aug. 20, 1857), however, a radical change was effected. This act, which came into operation on the 1st of January, 1858, established a new court for trying divorce causes, called the Court for Divorce and Matrimonial Causes, and consisting of the lord-chancellor, the chief judges, the senior puisne judges of the Court of Queen's Bench, Common Pleas, and Exchequer, and the judge of the Court of Probate, who is called judge ordinary, and has power to sit alone, or with one or more of the judges mentioned. The judge ordinary sitting alone may pronounce a decree *nisi*, which cannot take effect within less than three months. The husband may obtain a divorce for simple adultery; but if the wife is the petitioner, she must show cruelty or desertion in addition. Either party may marry again after divorce. A divorce cannot be obtained if it appear that the petitioner has been guilty of the same offence, or that there is collusion between the parties to obtain a divorce, or if they have condoned the offence by living together as man and wife after discovery. The act also abolishes divorces *a mensâ et thoro*, substituting, however, judicial separations, which have entirely the same effect, the only difference being that a judicial separation is not pronounced by an ecclesiastical court, but by the new court established by the act. In Scotland, from the time of the Reformation, divorce might be obtained by either party on the ground of adultery, marriage being held to be only a civil contract, and as such under the jurisdiction of the civil courts. Condonation or collusion is sufficient to prevent a divorce from being obtained on the ground of adultery, but not recrimination, that is a

counter charge of adultery. Wilful desertion is also held a valid reason for divorce. The action is carried on before the Court of Session.

In the United States of America, marriage, though it may be celebrated before clergymen as well as civil magistrates, is considered to be a civil contract. The causes of divorce, and the facility or difficulty of obtaining it, are by no means the same in the several states; and the diversity in this respect is so great, that instances have heretofore not been unfrequent of one of the parties removing into a neighbouring state, for the express purpose of obtaining a divorce *a vinculo*. The more general causes of such a divorce are, former marriage, physical incapacity, or fraudulent contract, according to the expression in the Connecticut law, to include these and other causes; consanguinity; and the New York code particularly enumerates idiocy and insanity, and the circumstance of either party being under the age of consent. Adultery is also a cause of divorce *a vinculo;* but the laws of some of the states prohibit the guilty party from marrying again. If the husband or wife is absent seven years, or, by the laws of some of the states, three years, and not heard from, the other is at liberty to marry again; and in some states, if the husband desert the wife, and make no provision for her support during three years, being able to make such provision, the wife can obtain a divorce. Extreme cruelty in either party is also, generally, a cause of divorce, either *a vinculo* or *a mensâ*. In many of the states applications to the legislature for divorce, in cases not provided for by the statutes, are very frequent. The laws prescribe the provision to be made for the wife in case of divorce, confiding to the courts, however, some degree of discretion in fixing the amount of alimony. See DESERTION OF SPOUSE.

DIXMUDE, a town, Belgium, province of West Flanders, on the right bank of the navigable Yser, 20 miles south-west of Bruges; pop. 3926. It was first walled in the tenth century, was fortified in 1270 and 1411, and figures much in the wars of the Low Countries. Its principle edifice is a large and handsome Gothic church, with a stone rood-screen of beautiful workmanship, and a fine Adoration of the Magi, by Jordaens. The trade is in agricultural produce, chiefly butter.

DIZÉ, MICHEL JEAN JACQUES, was born at Aine, in the department Landes, and acted as lecture assistant of Darcet at the Collége de France from 1784 to 1791. During this period he became acquainted with Leblanc, surgeon to the Duke of Orleans, who had the idea of making washing-soda out of common salt, but whose process had only yielded sulphide of sodium. Leblanc had tried to induce the duke to found a work, but before expending any money the duke referred the matter to Darcet. He, busy with other matters, handed the inquiry over to his assistant, Dizé, and in August, 1790, the experiments began. They tried ignition of sulphate of sodium with carbon to no purpose, and repeated it in a variety of ways. After three months trials, and when the money advanced by the duke was nearly exhausted, Dizé observed that the solution of a piece which had been made with an accidental admixture of chalk contained less sulphur, and then having made another trial, at Darcet's suggestion, obtained crystals of carbonate of sodium. After having determined the proportions of the materials to use, Dizé built a small reverberatory furnace, in which 30 lbs. of crude soda were manufactured. Darcet having reported favourably, the duke promised 200,000 francs to erect a manufactory. Leblanc, who had at first taken offence at the discovery made by Dizé, afterwards invited him to join the company. Dizé was at first unwilling to leave Darcet, but he was urged by Darcet himself, and at length entered into partnership with Leblanc. The latter had obtained a patent for fifteen years, but it was in his own name, and Dizé was not mentioned. In the succeeding events Dizé seems to have been kept in the back-ground as much as possible, and although the arrangements of the works were made by him, it was with difficulty that the fact was allowed to appear in the report on them by the sanitary committee. Such very briefly is Dizé's account of the matter, from which it would appear that the process known as Leblanc's, and which is now employed on so vast a scale in St. Rollox at Glasgow, at Newcastle, and many other places, should in all justice be known as Dizé's and Leblanc's.

Their work was, not long after its establishment, sequestrated in spite of the patent, and the whole plant disposed of. It remained in its dilapidated state for some years, when it was rented by another company, who refitted it, and pursued the manufacture with great success. It is not surprising that Dizé, writing in 1810 of the treatment the discoverers had experienced, said, that 'losses, disappointment, troubles of every kind, had been the only reward which they had got for the benefits conferred by their labours on French industry.' Dizé died in 1852, having seen his opinions as to its economical importance fully confirmed. His published works are not very numerous; among them are some interesting researches upon the copper employed by the ancients for coins, medals, and tools.

DIZIER, ST. (ancient, *Desiderii Fanum*), a town, France, department of Haute-Marne, on the right bank of the Marne, where it becomes navigable, 35 miles south-east of Châlons; pop. 10,170. While fortified and a place of considerable strength, it was besieged and taken by the Emperor Charles V. in 1544. In 1814 its vicinity was the scene of some severe fighting between Napoleon and the allies. It is now open, the ramparts having been converted into public walks, but part of the old castle still remains, and the church has some curious Gothic windows. There are several blast-furnaces and other important iron-works in the vicinity.

DJIDDA. See JIDDA.

DJOKDJOKARTA, or NAJOE-DJIJO-KARTO, a residency on the island of Java, with a capital of the same name, bounded S. by the Indian Ocean; W. by Baglen; N., Kadoo and Soorakarta; and E., Soorakarta and Patjitan. Its only high mountain, the volcano Merapi, is 3150 feet high. It has no large river. Its forests abound in djatti (teak) wood. Its natural fertility would render it more valuable but for the impracticable country that bounds it on the land side, and the want of any good harbour on the coast; yet rice, coffee, and tobacco begin to be extensively cultivated on lands allocated to Europeans. This residency was the focus of the rebellion in 1825. It was once an independent kingdom, but is now ruled by a sultan dependent on the Dutch. Pop. 336,000.—The town, which is the seat of a native sultan and a Dutch resident, is large and regular. The sultan's water-palace is a curious town of itself, with subterranean approaches, walls, and towers. The resident's abode is in a fort which commands both the palace and the town. There are here a church, school, and shot-foundry. Besides the European guards of honour, the sultan has a guard composed of young females, armed with lance, sword, and pistol, who perform service on horseback as well as on foot, and from amongst whom he frequently selects his wives. Pop. 43,000.

DNIEPER (Russian, *Dnjepr;* anciently *Borysthenes*), a river of Russia which rises in the government of Smolensk, traverses Mogilev, separates part

of the latter government and the governments of Chernigov and Poltava from Minsk, Kiev, Kherson, and part of Ekaterinoslav, then traverses Ekaterinoslav, and in the lower part of its course separates Kherson and Taurida. It begins to be navigable a little above Smolensk. Notwithstanding the course of this river is so extensive, its navigation is only once interrupted by a series of cataracts, which commence about 200 miles from its mouth, and continue 30 or 40 miles. Since 1838 there has been a service of steam-boats on the river above the cataracts. A magnificent wrought-iron bar-chain suspension-bridge, one of the largest in Europe, was erected between 1848 and 1852 over the Dnieper, at Kiev, by the English engineer Charles Vignolles, by command of the Emperor of Russia.

DNIESTER (Russian, *Dnjestr;* the ancient *Tyras;* later *Danastris* or *Danastus*), a large river of Europe, which has its source in a lake in the Carpathian Mountains, in Austrian Galicia, and empties itself into the Black Sea, between Ovidiopol and Akerman, after a course of nearly 500 miles, N.W. to S.E., mostly through Russia, the government of which has done much towards improving its navigation, which is still, however, very insignificant. Only when the water is very high can ships of small burden ascend as far as Bender.

DOAB (Sanskrit, *Two Waters*), a name in Hindustan applied indiscriminately to any tract of country between two rivers. The tract between the Ganges and the Jumna is usually called *the* Doab; other similar tracts have their distinctive name, as the Bari Doab, between the Bias and Ghara and the Ravi; the Rechna Doab, between the Ravi and the Chenab; the Sind or Sindi-Sagar Doab, the north part of the tract between the Indus on the west and the Jilum and Chenab on the east; and the Chuch Doab, the south part of the same tract.

DOBBERAN, a celebrated watering-place in the duchy of Mecklenburg-Schwerin, about 2 or 3 miles from the Baltic, the usual summer residence of the grand-duke. About a mile from the place is the Heiliger Damm, or Holy Dam, a high natural mound of stones, curiously formed and coloured, stretching far into the Baltic. Tradition says that the sea threw up these stones in one night: it was perhaps the effect of an earthquake. Three miles distant from Dobberan is a bathing-house, the oldest establishment for sea-bathing in Germany. It was founded by the duke in 1793, and to it Dobberan has been chiefly indebted for its celebrity. Pop. about 4000.

DÖBELN, a town in Saxony, in the circle of Leipzig, and 36 miles south-east of the town of Leipzig, agreeably situated on an island formed by the Mulde and Mühlgraben, a kind of natural canal, at the junction of the railways between Leipzig and Dresden, and between Chemnitz and Riesa. It consists of the town proper and several suburbs, and is for the most part well built, with two churches, an hospital; manufactures of woollen and linen cloth, brass-ware, hats and shoes, several bleach-fields and mills; a considerable trade in butter, a large weekly corn-market, and three annual fairs. Pop. in 1871, 10,078.

DÖBEREINER, JOHN WOLFGANG, an eminent German chemist, born at Hof, Dec. 15, 1780, after a very limited school education, began the study of pharmacy at Münchberg in 1795, practised as a druggist at Carlsruhe and Strasburg, and devoted his leisure to the study of philosophy, botany, mineralogy, and chemistry. In 1803 he engaged in a mercantile business, but two years after was obliged to give it up, and resolved to devote himself entirely to chemical pursuits. In 1810 he was appointed professor of chemistry, pharmacy, and technology at Jena, and held the situation till his death, March 24, 1849. He wrote various treatises, among which are Elements of Pharmaceutical Chemistry, and more especially a General Chemistry, with Supplement, and published a multitude of investigations upon organic and inorganic chemistry. They relate to curious and important points of theory and practical application, but they would have had more weight had they been less miscellaneous. The discovery by which he is best known is that of the power which spongy platinum has of becoming red-hot in inflammable vapour, and of thus causing the ignition of hydrogen in the air, and the detonation of hydrogen and oxygen. But perhaps of more importance in its results, is the observation he made while examining spongy platinum, of the escape of hydrogen gas through a capillary fissure in a glass receiver, and of which the true explanation was afterwards given by Graham.

DÖBRENTEI, GABOR (*Gabriel*), a Hungarian poet and antiquary, was born at Nagy-Szöllös in 1786, and studied at the gymnasium of Oedenburg, where at a very early period he displayed great enthusiasm in the study of the Hungarian language and literature, and established for this purpose a society, of which a volume of Transactions was published under his superintendence while yet a youth of nineteen. In 1806 he attended the University of Leipzig, and the following year became tutor to Count Louis Gyulay, a Transylvanian nobleman. He subsequently started a magazine, the Erdelyi Muzéum, which contains much interesting matter on the subject of Hungary, but which ceased after the tenth number. In 1820 he removed to Pesth, where he continued subsequently to reside, actively engaged in literary labours while also holding various civil offices. He was one of the twenty-two savants invited to assemble at Buda for the purpose of organizing the Hungarian Academy, and in 1831 was appointed secretary to that body. In 1837 he resigned the latter post, and commenced his great work, the Ancient Monuments of the Hungarian Language, four volumes of which were published during his life; a fifth was left nearly completed at his death. He is also the author of several biographical sketches of old Hungarian authors. His poems consist of odes, epigrams, and elegies; and he also translated into Hungarian Molière's L'Avare, and several of Shakspeare's and Schiller's plays. He died in March, 1851.

DOBROWSKY, JOSEPH, the founder of Slavonic philology, born Aug. 17, 1753, at Györmet, not far from Raab, in Hungary. In 1772 he was admitted into the order of the Jesuits at Brünn, and on its suppression returned to Prague to prosecute his theological studies. Here, in 1776, he became tutor in the family of Count Nostitz, and shortly after appeared his literary work entitled Fragmentum Pragense Evangelii S. Marci, vulgo Autographi. It produced an uncommon sensation, from the depth of learning with which he proved the spuriousness of this pretended original of St. Mark. By the publication of a Journal on contemporary Bohemian and Moravian Literature (Prague, 1780–87) he involved himself in many disputes, but still even by this his fame was extended. In 1787 he was appointed vice-rector of the general seminary at Hradisch, near Olmütz, and in 1789 rector; but in 1790, on the suppression of the general seminaries of the Austrian monarchy, he was left without employment. In 1792 he set out in search of MSS. connected with Bohemian literature, and visited Stockholm, Abo, Petersburg, and Moscow; and in 1794, with the same object, he travelled through Germany, Italy, and Switzerland. On his return he experienced the first attacks of a mental malady, which gradually increased to such a degree that in 1801 he was removed to a lunatic

asylum. After his recovery in 1803 he passed the winter in Prague, and the summer in the country. He died on a visit to Brünn, Jan. 6, 1829. Among his numerous writings may be mentioned, as of particular value to Slavonian literature, his Scriptores Rerum Bohemicarum, De Sacerdotum in Bohemia Cœlibatu, Geschichte der bohm. Sprache und ältern Literatur, and Die Bildsamkeit der slaw. Sprache. In his valuable German and Bohemian Dictionary he was greatly assisted by Leschka, Puchmayer, and Hanka. All his works are either in German or Latin.

DOBRUDSHA, The, a territory in the north-east of Bulgaria, European Turkey, included between the Danube, which forms its boundary on the west and north, the Black Sea on the east, and Trajan's Wall on the south, which extends from Kustendji on the Black Sea to Chernavoda on the Danube. In its centre it is traversed from north to south by a range of upland downs, which forms a sort of watershed between the Danube and the sea; in the east it is marshy and contains several lakes. There is a great scarcity of good water for drinking. It contains, however, many fertile spots, but in the summer, like the countries adjoining it, resembles a desert; while in the spring, from the melting of the snows, the soil takes the appearance of a vast muddy slough. The inhabitants support themselves by rearing sheep and buffaloes. The fauna is large and diversified, comprising eagles, bustards, cranes, wild geese, partridges, kites, ducks, wild swans, and wild dogs. The principal town is Babadagh, situated in the north-east, about 4 miles to the west of Lake Rassein. This district is of some military importance, since an army occupying it commands the entrance to the Danube, as was seen in the Crimean war, when the Russian army seized it, compelling the Turks to fall back on the fortress of Silistria.

DOCETÆ (from Greek *dokein*, to seem or appear), the name given, in the earlier ages of the church, to those who denied the reality of the human form of Christ, maintaining it to be merely a phantom or shadow. This belief was not the peculiarity of any special sect, but was shared in a greater or less degree by several, the Gnostics being those who adopted it in its strongest form. Some maintained that another man was substituted for the real Saviour at the crucifixion. In the sense of regarding Christ's body as a heavenly and ethereal, instead of a human one, docetism had its partisans even among the orthodox. Some passages in the gospel and epistles of St. John are supposed to be directed against this heresy.

DOCIMASY (Greek, *dokimazō*, I prove or assay), the art of testing ores and minerals, and of ascertaining the amount of their constituents, especially for metallurgic and other technical purposes. It is, therefore, simply a branch of chemical analysis, and the name has almost disappeared from English works though it is still used in French. The origin of the analysis of ores is to be found probably in the desire of the metallurgist to ascertain whether a particular mineral contains the metal he desires, and in sufficient quantity to pay extraction. If he has any doubt he will naturally subject a little of the mineral to the same operation, but on a much smaller scale, as that which he pursues on the great, and thus with a small expenditure of time and labour, material and apparatus, determine whether it will be worth while working the ore at all, and if so, with what precautions. In this way docimasy, or the art of assaying, arose in the metallurgic works, and formed so essential a part of them that the older writers perceived no difference between *docimasia* and *metallurgia*, but the quantity of substance operated on and the greater care requisite to get an exact result. The old system, therefore, consisted almost entirely of analysis by the dry method, whereby the metal expected was obtained in the metallic state, or in some recognized and convenient form. A small fragment of the mineral was pounded, mixed with fluxes, and heated in the docimastic or assaying furnace until it was decomposed. Special methods were employed for ores of silver, gold, copper, &c. &c., and the quantities were carefully weighed.

The dry method is still pursued in mining and metallurgic laboratories for the assay of gold, silver, and other alloys, and for ores of copper, tin, and other metals. The methods consist in preparing a sample of the substance by pounding and grinding, and then heating it alone, or with oxidizing or reducing agents and fluxes, according to circumstances, in furnaces of different forms. The dry method, however, has been practically displaced by the wet form of analysis, that in which the body is precipitated from its solutions by a reagent, or estimated in the solution volumetrically. Each method has its advantages; the dry is more direct, simpler of execution, but not so complete or so accurate; the wet is more delicate, and includes all the substances present. The dry method is therefore well adapted for its special aim, the estimation of one important constituent, besides being at the same time a pattern of the method of extraction to be afterwards followed.

Practically, however, both methods have frequently —in some cases always—to be applied in the analysis of minerals. The preliminary decomposition of the substance is almost invariably effected by fusion, as being the quickest way of converting it from the insoluble to the soluble state, and then the solution obtained is examined by addition of reagents in a definite order.

DOCK, a name applied to different species of the genus *Rumex*, including sorrels and docks. These are large herbaceous plants, with stout roots, alternate and often entire leaves, and bearing panicles of small greenish flowers. Their roots have an austere taste, and are astringent and styptic. The root of the water-dock (*Rumex aquaticus*) strikes a black colour in a solution of sulphate of iron. Numerous species of this genus are known. The term dock is frequently applied to other large weeds.

DOCKET, a statement written on a small piece of paper or parchment, of the effect or contents of any greater writing.

DOCKS are usually artificial inclosures for the reception of vessels, and provided with gates to keep in or shut out the tide. They are called *wet-docks* when they are intended to receive vessels for loading and unloading, the gates being in this case constructed so as to keep in the tide, and thus preserve the water within the docks as nearly as possible at the uniform level of high water. They are called *dry-docks*, or *graving-docks*, when they are intended to admit vessels to be examined and repaired when necessary, the gates in this case being such as to keep out the tide, and thus keep the dock dry while the shipwrights are engaged on the vessel. There is another kind of dry-docks called *floating-docks*, in which gates to keep out the tide are unnecessary, inasmuch as this kind of docks, as their name indicates, float on the surface of the water, and may be sunk sufficiently to allow of a vessel being floated into them, and then raised again, so that the bottom of the dock, on which the keel of the vessel rests, rises some distance above the surface of the water.

The object of constructing wet-docks is to obviate the numerous inconveniences attending the loading and unloading of vessels in a tide-river, or in a harbour not entirely land-locked, where it may either be impossible to bring the vessels close to the wharves,

or when brought there at the flood of the tide, they are left dry at the ebb, and thus suffer continual damage by straining, by delay from neap-tides, and other accidents. Another advantage of providing wet-docks for the reception of vessels is, that by suitable police regulations it is much easier to protect them from pillage and damage than when they are kept in open places. The first wet-docks constructed in England were those now called the Commercial Docks, in London, which existed under the name of the Howland Great Wet-dock so early as 1660. Since that time they have been greatly enlarged, and now, with the adjoining wharves, sheds, &c., cover a total area of about 335 acres, 176 of which are water. These docks are on the south side of the Thames, and it was considerably more than a century before any docks were constructed on the north side of the river, and not till long after a wet-dock had been possessed by Liverpool. The most important docks on the north side of the river are the Victoria Docks, the East and West India Docks, the Millwall Docks, the London Docks, and St. Katherine's Dock. The total extent of the Victoria Docks, including land and water, is about 200 acres, nearly 100 acres of which are occupied by water, the dock proper being 74 acres in extent, the half-tide basin at the entrance 16 acres, and the rest being occupied by the locks. The lock-gates, cranes, and capstans connected with these docks are all worked by hydraulic power. The East India Docks consist of an import dock for vessels discharging their cargoes, about 18 acres in extent, and an export dock of about 9 acres for ships loading. The West India Docks consist of an import and export dock, and the south dock. The export dock is about 25, and the import dock about 30 acres in extent. The south dock was originally intended only as a canal to enable ships to escape the circuitous route round the Isle of Dogs, but, being disused for that purpose, it now serves as a dock for vessels engaged in the wood trade. The Millwall Docks are not yet completed according to the original plan. In 1868 a portion of them, having a water acreage of about 33 acres, was opened, and it is not intended to proceed with the remainder until the requirements of trade demand it. When complete they will have a water area of 52 acres, together with 152 acres of wharf and warehouse accommodation. The London Docks consist of the eastern and western docks and the tobacco dock. The total water acreage is about 28 acres. The warehouses in connection with these docks are extremely capacious. The tobacco warehouse is itself nearly 5 acres in extent. Lastly, St. Katherine's Docks occupy a space about 24 acres in extent, nearly 11 of which are water. Next after the London docks come those of Liverpool. They are very numerous, and extend 5 or 6 miles along the north bank of the Mersey, and though separately not generally so large as the London docks, they cover, together with the Birkenhead docks, which belong to the Liverpool corporation, nearly as large a total acreage. The first dock in Liverpool was constructed in 1715, but this one was afterwards filled up. The other important docks in the kingdom are those at Southampton, Bristol, Hull, Great Grimsby, Newcastle, South Shields, Dundee, &c.

Dry-docks are built of strong masonry, and their entrance is closed either by swinging gates opening in the middle, and when shut presenting a salient angle to the water in the river or harbour from which the dock is entered, or by a framework called a *caisson*, built like the hull of a ship, with a keel and a stem at both ends. When the caisson is empty it floats, and may be removed to admit of a vessel being floated into the dock, or floated out of it. If a vessel has been admitted into the dock for the purpose of being examined and repaired, the caisson is placed at the entrance of the dock, and being filled with water is allowed to sink into grooves prepared for the purpose, there being separate grooves for the keel and stems as well as a bed for the caisson to rest in. In this position the caisson effectually keeps out the tide, and the water in the graving-dock is now pumped out. When the graving-dock is dry the keel of the ship to be examined rests on wooden blocks fastened along the middle line of the bottom of the dock; its bilges are supported by other wooden blocks piled up underneath; and its sides are supported by shores or props, the lower ends of which rest on the steps which form the sides of the dock, and the upper ends of which rest against the sides of the ship. These props are placed at different heights so that the whole vessel may be properly supported. When the repairs are finished the water is again let into the dock and allowed to rise to the level of the water outside, the caisson is floated by having the water pumped out of it, and the vessel is then floated out of the dock.

Floating-docks are open at both ends, since, as has already been explained, it is not necessary to shut the water out of them. There are three methods of constructing them. Sometimes the floating-docks are themselves built in watertight compartments, and are sunk to any required depth by the admission of water. When they have sunk to such a depth as to allow the vessel to be docked to float easily above the bottom of the dock, the dock is raised by having the water pumped out until its bottom touches the keel of the ship. Props are then applied as in an ordinary dry-dock, and the ship is raised out of the water by the compartments of the dock being still further emptied. Instead of building the dock itself in watertight compartments, watertight tanks are sometimes applied to it, and this kind of dock is sunk and raised in a way exactly similar to that in which one of the first kind is sunk and raised. The third method of building floating-docks is to make them so heavy that they sink by their own weight deep enough for the largest vessels that can be docked in them to sail over their bottom. They are then raised by forcing down watertight tanks, which lift them up by their buoyancy. Into these tanks water is never admitted.

A kind of dry-dock, called the *hydraulic lift dock*, which has some decided advantages over other kinds, has been set up in connection with the Victoria Docks in London, and also at several places besides. It consists of a double row of iron columns, each of which contains a hydraulic press. All these hydraulic presses can be worked simultaneously by a powerful steam-engine, and their combined action has the effect of raising a series of tranverse iron girders stretching from the columns on one side to those of the other. An iron pontoon is first floated above these girders, and then sunk so as to rest on them, and the ship to be docked is floated above the pontoon and supported by blocks resting only upon the pontoon, so that the ship is in no way connected with the columns on each side. The hydraulic presses are then set to work, the girders with the pontoon and ship are raised high enough for the water to be run out of the pontoon, which is then sufficiently buoyant to float the ship. The pontoon may now be floated away clear of the dock, and after the girders have been allowed to sink again, another pontoon may be floated on to them, so that as many ships can be docked as there are pontoons to float them.

DOCKUM, a town, Holland, province of Friesland, on both sides of the Ee, 13 miles north-east of Leeuwarden; pop. 4535. It is built in the form of a hexagon, and surrounded by a wall flanked with

bastions. Its extensive water communication, both by the Ee and by canals, enables it to carry on an extensive trade.

DOCK-WARRANTS are orders for goods kept in the warehouses of any of the docks. They are granted by the proper officer at the docks to the importer in favour of any one that he may name. These warrants are held to be negotiable, so that they may pass from one holder to another, the property of them being always vested in the holder. A holder of a dock-warrant need not assign the whole of it; he may divide it into several warrants for smaller amounts, and assign any part of the warrant originally given to him. Careful rules are issued by the dock companies as to the granting of warrants, and unless these are complied with goods will not be delivered.

DOCK-YARD BATTALIONS form a part of the British army, chiefly intended for the defence of the naval dock-yards. The men forming the force are only drilled for a few hours every week in summer, and are engaged as clerks, artisans, or labourers during the rest of their time. They are paid for the time that they spend in drilling.

DOCK-YARDS, establishments supplied with all sorts of naval stores and timber for ship-building, together with building slips and sheds, docks, roperies, blockmaking machinery, and such like. In England the royal dock-yards are at Chatham, Sheerness, Portsmouth, Devonport, and Pembroke, besides the Deptford and Woolwich store-yards. Those in our colonies are at the Cape of Good Hope, Gibraltar, Malta, Halifax, Bermuda, Antigua, Jamaica, Sierra Leone, Trincomalee, Singapore, Hong-Kong, Esquimalt (Vancouver's Island), and Shanghai. There her majesty's ships and vessels of war are generally moored during peace, and such as want repairing are taken into the docks, examined, and refitted for service. Until 1831 the royal dock-yards were governed by a commissioner resident at the port, who superintended all the musters of officers, artificers, and labourers employed about the dock-yard and ordinary. He also controlled their payment, examined their accounts, contracted and drew bills on the navy office to supply the deficiency of stores, and finally regulated whatever belonged to the dock-yard. In 1831 the commissioners of the navy were abolished, and admirals and captains superintendent command the dock-yards under the controller of the navy and the admiralty.

DOCTOR, a term literally signifying teacher, and applied by the ancient Romans to those who delivered public lectures upon philosophical subjects, grammar, rhetoric, &c. In the middle ages, from the twelfth century, it came into use as a title of honour borne by men of great learning, as by Thomas Aquinas (Doctor Angelicus), Duns Scotus (Doctor Subtilis), Roger Bacon (Doctor Mirabilis), Bonaventura (Doctor Seraphicus), and other distinguished schoolmen. It was first made an academical title at the University of Bologna, in Italy, which received from the emperor the right of appointing *doctores legum* (doctors of laws). Soon after the popes granted the universities the right of appointing *doctores canonum et decretalium* (teachers of the canon law); and when the study of the civil law came to be combined with that of the canon law, the title was changed to *doctor utriusque juris* (that is, teacher of both laws). The faculties of theology and medicine followed that of law in conferring this title. The faculty of arts is now the only one that retains the title of Magister or Master instead of Doctor; and in the universities of Germany, in the course of the eighteenth century, the former title gradually gave way to the latter, even in the philosophical faculty, that which corresponds to the faculty of arts in our universities. The degree of Doctor is either conferred publicly, with certain ceremonies, or by diploma. The title of Doctor is in some cases an honorary degree, and in some cases conferred after examination. The title of D.C.L. (Doctor of Civil Law), for example, at the University of Oxford and at Trinity College, Dublin, is an honorary degree, and so also are those of D.D. (Doctor of Divinity) and LL.D. (Doctor of Laws) at the Scotch universities, while the title of M.D. at the Scotch universities is conferred only upon those who have written a thesis on some medical subject which has been approved by the examiners, and who have previously passed as Bachelors of Medicine and Masters of Surgery. On the continent of Europe the order of rank is this: Doctor of Theology, of Law, of Medicine, and of Philosophy; but in England and the United States of America the Doctor of Law ranks first, and the Doctor of Divinity next. The degree of Doctor of Music is conferred at the Universities of Oxford and Cambridge. The great Haydn and Romberg received this title from the University of Oxford. The title of D.Sc. (Doctor of Science) is also conferred by some universities.

DOCTORS' COMMONS. See COLLEGE OF CIVILIANS.

DOCTRINAIRES. After the second restoration of the Bourbons a small number of deputies in the French chamber would neither rank themselves among the friends of absolute power nor among the defenders of the revolution. They supported Decazes while he was minister; and several of them held offices in the ministry, as, for instance, the counsellors of state, Camille Jordan and Royer-Collard. Their system embraced a constitutional monarchy, allowing the government more power than the ultra-liberals would admit; and, on the other hand, restricting the royal power more, and admitting less approach towards the old form of government than the ultra-royalists demanded. They retired with Decazes, and afterwards joined the liberal opposition. The first orator among them was Royer-Collard, and their most distinguished writer out of the chamber, Guizot. They received the name of *doctrinaires* because they were looked upon more as theoretical constitution-makers than practical politicians.

DODDER. See CUSCUTACEÆ.

DODDRIDGE, PHILIP, an eminent Dissenting divine. His father was a tradesman in London, and he was born there in 1702. In 1722 he became minister of a Dissenting congregation at Kilworth, and in 1729 was called to a like position at Northampton, where he founded the Theological Academy, of which he became president. Here he resided nearly twenty-two years. He died, October 26, 1751, at Lisbon, whither he had gone in the hope of deriving benefit in a pulmonary complaint from the change of air. Dr. Doddridge distinguished himself by a commentary on the New Testament, published under the title of the Family Expositor, which became deservedly popular, and has gone through many editions. After his death appeared a Course of Lectures on the Principal Subjects of Pneumatology, Ethics, and Divinity, with References to the most considerable authors on each of those subjects (1763). Dr. Doddridge was also the author of sermons, hymns, devotional treatises, &c.

DODECAGON, a figure inclosed by twelve equal straight lines.

DODECAHEDRON, a regular solid contained under twelve equal and regular pentagons, or having twelve equal bases.

DODECANDRIA (from Greek *dōdeka*, twelve, and *anēr*, man), the twelfth class of Linnæus, in botany, comprising plants having twelve to eighteen stamens.

DÖDERLEIN, Wilhelm Ludwig, a noted German philologist, son of the theologian Johann Christian Döderlein, born at Jena, Dec. 19, 1791; died at Erlangen, Nov. 9, 1863. His father died while he was still young, but he was carefully educated by his step-father, the theologian Niethammer. He studied at the universities of Munich, Heidelberg, Erlangen, and Berlin, and in 1815 became professor of philology at Bern. In 1819 he was appointed second professor of theology and rector of the gymnasium at Erlangen, and in 1827 first professor of theology and eloquence at the same place. The appointment of rector of the gymnasium he retained till 1862, and in this situation especially his influence was most beneficial. Of his numerous writings, besides his editions of Horace and Tacitus, and the Homeric Glossary (Erlangen, three vols. 1850–58), his Handbuch der lat. Synonymik (Handbook of Latin Synonyms, Leipzig, 1839), and Handbuch der lat. Etymologie (Handbook of Latin Etymology, Leipzig, 1841), are specially worthy of mention. A collection of his public addresses (Erlangen, two vols. 1843–47) also met with great acceptance.

DODINGTON, George Bubb, Lord Melcombe-Regis, was the son of a gentleman of fortune; or as others say, of an apothecary named Bubb, who married into a wealthy family in Dorsetshire. He was born in 1691, was elected member of Parliament for Winchelsea in 1715, and was soon after appointed envoy to the court of Spain. In 1720, by the death of his maternal uncle, he came into possession of a large estate, and took the surname of Dodington. In 1724, having closely connected himself with Sir Robert Walpole, he was appointed a lord of the treasury, and became clerk of the pells in Ireland. He afterwards joined the opposition, and on the fall of Walpole became treasurer of the navy. This party he also quitted, in order to lead the opposition under Frederick, prince of Wales, whose death for some time arrested his career. In 1755 he accepted his former post of treasurer of the navy, under the Duke of Newcastle, but lost it the following year. On the accession of George III. he was early received into the confidence of Lord Bute; and in 1761 was advanced to the peerage by the title of Lord Melcombe, and died in 1762. This versatile politician was generous, magnificent, and convivial in private life, and the patron or friend of Young, Thomson, Glover, Fielding, Bentley, Voltaire, Lyttelton, and Chesterfield, who, with many of meaner pretensions, mingled at his hospitable table. He is best known by his celebrated Diary, published in 1784 by Henry Penruddock Wyndham, Esq. A more curious exposition of avarice, vanity, servility, and selfishness, as a place-hunter and trading politician has seldom been exhibited. It is a most extraordinary instance of a self-recorded and seemingly unconscious prostration of honourable and manly feelings to the acquirement of place, emolument, and court favour.

DODO, or Dronte (*Didus ineptus*), the name of a very remarkable extinct bird, discovered by the Portuguese in 1499 on the island of Mauritius, and afterwards seen there by the Dutch both at the end of the sixteenth and in the beginning of the seventeenth century. As it was never seen after this it was deemed by some altogether fabulous; but its actual existence was completely established not only by drawings but by fragments; among others, a foot, in the British Museum, and both a head and a foot in the Ashmolean Museum at Oxford. In 1865 hundreds of bones of the dodo were found in a marsh in Mauritius, and a complete or almost complete skeleton has been set up in the British Museum. It had short and ill-shaped legs and feet, scarcely able to support its clumsy and almost globular body, which was about twice as large as that of a turkey, and a monstrous head, which, apparently ill-attached to its body, contained an enormous mouth, and terminated in a strong hooked beak. Though covered with thick plumes, it was destitute of wings sufficient for flight, and had their place supplied by mere stumps or rudimentary appendages, covered with soft ash-coloured feathers, intermixed with yellowish-white; the tail was composed of a few small curled feathers of the same description. Naturalists are now pretty well agreed that the dodo was a gallinaceous bird, and that it should be put in the order or sub-order Columbæ or pigeons, as an extreme modification of this type. It is by some considered as the representative of an allied group, the Dididæ.

DODONA, a celebrated town in Epirus, built, according to tradition, by Deucalion, in the neighbourhood of which was one of the most ancient oracles in Greece. The site of this ancient town is not known with certainty, but it is now pretty generally agreed that it must have lain somewhere in the valley which incloses the lakes now called Lapsista and Jannina, in the south of Albania, and it is placed with most probability on an isolated hill called Kastritza, situated near the southern end of the latter lake. The site of the oracle cannot be so satisfactorily determined. Some place it upon a rocky eminence jutting out into the lake from the town of Jannina, others upon the summit of the hill of Kastritza already mentioned, while others think that it must have been situated between the margin of the Lake of Jannina and the hills inclosing the valley on the east. This oracle was the most ancient in Greece, and long maintained its celebrity. It belonged to the Palasgic Zeus, who was supposed to dwell in the stem of an oak-tree. Zeus, says the fable, had presented to his daughter Thebe two doves which possessed the faculty of speaking. One day they left Thebes in Egypt, taking their course, the one to Libya, where it founded the oracle of Zeus Ammon; the other to Epirus, where, alighting on an oak-tree, it announced in a loud voice to the inhabitants, that it was the will of Zeus to establish there an oracle. Such is the story told by Herodotus, but there is no reason whatever for believing that there was any connection between the oracle of Dodona and the Egyptian Thebes and the oracle of Zeus Ammon, as this story would seem to indicate. The sacred edifice at Dodona was probably a building of no very imposing dimensions. It was surrounded with pillared porticoes, and rich in votive offerings. The plan which Alexander the Great at one time cherished of building a splendid temple to Zeus at Dodona was never carried out. The prophetic priestesses announced the divine communications in different ways. They approached the sacred tree, and listened to the rustling of its leaves; or, standing by the fountain at the foot of the tree, observed the murmuring of the water which gushed forth from the earth. They also prophesied from the sounds issuing from brazen vessels, which were suspended from the pillars of the temple, &c. The sanctuary at Dodona was destroyed by Dorimachus, the Ætolian general, in 219 B.C.

DODSLEY, Robert, an ingenious poet and dramatist, was born of parents in humble life at Mansfield, in Nottinghamshire, in 1703. He was apprenticed to a stocking-weaver, but left that employment, became footman to the Hon. Mrs. Lowther, and published by subscription a volume of poems, entitled the Muse in Livery, which attracted public favour, less from its intrinsic merit than from the situation of the author. His next effort was the Toyshop, a dramatic satire on the fashionable follies of the time. Pope patronized this piece, and through his influence it was brought upon the stage in 1735. Dodsley was

enabled, by his profits as an author, to set up a bookseller's shop in Pall-Mall, which ultimately proved a very prosperous concern. He next wrote the farce of the King and the Miller of Mansfield, founded on an old ballad; which succeeded so well that he produced a sequel to it, called Sir John Cockle at Court. In 1741 he brought out a musical piece, entitled the Blind Beggar of Bethnal Green; and in 1745 he made an attempt to introduce on the stage a new species of pantomime, in Rex et Pontifex. A loyal masque in honour of the peace of Aix-la-Chapelle appeared in 1749. His next work was the Economy of Human Life, a well-known collection of moral maxims. He wrote a tragedy, entitled Cleone, which had some success on the stage, but possesses no extraordinary merit. A selection of Fables in prose, with an Essay on Fables prefixed, was one of his latest productions. Having acquired a competent fortune by his double occupation of author and bookseller, he retired from business. He died at Durham in 1764. He planned the Preceptor; the Collection of Old Plays, twelve vols. 12mo; and the Collection of Poems by Different Hands, six vols. 12mo.

DODWELL, Henry, a critic and theological writer of distinction, was born at Dublin in 1641, and owing to family misfortunes during the Irish rebellion, and the death of his father, was early subjected to a life of want and dependence. Sir Henry Slingsby, his mother's brother, at length enabled him to obtain some education. In 1656 he became a student of Trinity College, Dublin, where he distinguished himself by his application, and was chosen to a fellowship. This station he resigned in 1666, because he had scruples relative to the lawfulness of taking orders in the church, as enjoined by the statutes of the college. He then visited England, and for some time resided at Oxford. Returning to Ireland, he began his career of authorship with a preface to a theological tract of his tutor Dr. Stearn. In 1674 he came again to England and settled in London, where he continued to employ his pen. In 1688 he was chosen Camden professor of history at Oxford. After the Revolution his high-church principles inducing him to espouse the cause of the non-jurors, he was deprived of his office. He died in 1711. He produced a multitude of works relating to theological and classical literature. Of these the most valuable is entitled De Veteribus Græcorum, Romanorumque Cyclis, obiterque de Cyclo Judæorum Ætate Christi, Dissertationes X., cum Tabulis Necessariis, &c. (folio); and another, entitled An Epistolary Discourse, proving from the Scriptures and the first Fathers, that the soul is a Principle naturally mortal, but immortalized actually by the Pleasure of God, to Punishment or to Reward, by its union with the divine baptismal Spirit; where it is proved that none have the Power of giving this divine immortalizing Spirit since the Apostles, but only the Bishops. This work gave rise to a warm controversy, and subjected the author to much obloquy.

DOE, John, and Richard ROE, two fictitious personages of the English law who formerly appeared in a suit of ejectment. The former was the plaintiff and the latter the defendant. The fiction on which their appearance was based was abolished by the Common Law Procedure Act (15 and 16 Vict. cap. lxvi.), and now accordingly they do not appear. See Ejectment.

DOESBURG (ancient, *Drusi Burgum*), a town in Holland, in the province of Gelderland, on the right bank of the Ijssel, 9 miles north-east of Arnheim. It is surrounded by walls with planted ramparts, consists of spacious and handsome streets, and has a large arsenal and two Reformed churches, one of which is surmounted by a tower and contains the tomb of the celebrated geographer Gerard Mercator. The trade is chiefly in agricultural produce, among which that of mustard may be regarded as a staple. Pop. 4408.

DOFFER, part of a carding-machine. See Cotton Spinning.

DOG (*Canis familiaris*). To no animal is mankind more indebted for faithful and unswerving affection than to the dog. His incorruptible fidelity, his forbearing and enduring attachment, his inexhaustible diligence, ardour, and obedience, have been noticed and eulogized from the earliest times. This valuable quadruped may be emphatically termed the friend of man; as, unlike other animals, his attachment is purely personal, and uninfluenced by changes of time or place. The dog seems to remember only the benefits which he may have received, and instead of discovering resentment when he is chastised, exposes himself to torture, and even licks the hand from which it proceeds. Without the aid of this almost reasoning animal, how could man have resisted the attacks of the savage and ferocious tenants of the forest, or have procured sustenance in those ages of the world when agriculture was unknown!

When we attempt to trace the source or origin of the species it will be found that the changes and varieties which the influence of domestication and the intermixture of races have produced are so multifarious and interminable as to baffle all research. Pennant is of opinion that the original stock of dogs in the old world is with great reason supposed to be the jackal; that from their tamed offspring, casually crossed with the wolf, the fox, and even the hyæna, have arisen the numberless forms and sizes of the canine race. Buffon, with much ingenuity, has traced out a genealogical table of all the known dogs, deducing all the other varieties from the shepherd's dog, variously affected by climate and other casual circumstances. From observations of travellers in the high northern parts of the world, where, although dogs have been employed for an incalculable length of time, they still retain much of the external appearance and general carriage of a wild animal, it would seem that Pennant's suggestion is worthy of attention. But, at the same time, it should be remarked that the breed of dogs produced from the wolf and varieties of the domestic dog, during a long succession of generations, still retains marked characteristics of the predominance of the savage qualities derived from its untamed progenitors in the keen and vivid expression of the eye, ferocity of disposition, and severity of bite. It is also a singular fact that European dogs evince as great an antipathy to the Esquimaux species as to a wolf.

Linnæus has asserted that the tail of this animal, in all its species and varieties, invariably bends to the left; but although such is very often the case it is by no means universal, as the slightest observation will demonstrate. Desmarest, however, has remarked a peculiarity as respects the tail of dogs which appears much better entitled to rank as a specific character; that whenever this member is of white united with any other colour, the white is always terminal. The same remark applies to other species of this genus, equally with the dogs.

Naturalists have divided dogs into several classes: 1. *Mastiffs*, including the dog of New Holland, the mastiff (particularly so called), the Danish dog, and the varieties of grayhound; 2. The *spaniels*, including the spaniel and its varieties, the water-dog, the hound, the terrier, the shepherd's dog, the wolf-dog, the Siberian dog, the Esquimaux dog, and the alco or Peruvian dog; 3. *Bull-dogs*, consisting of the bull-dog and its varieties, the house-dog, the turnspit, the pug, &c.

The sagacity and attention of the dog are so great that it is not difficult to teach him to hunt, dance, and exhibit a thousand tricks. The mode in which he is taught to point out different cards that are placed near him is this:—He is first taught, by repeated trials, to know something by a certain mark, and then to distinguish one ace from another; food is frequently offered him on a card he is unacquainted with, after which he is sent to search it out from the pack; and after a little experience he never mistakes. Profiting by the discovery of receiving food and caresses for his docility, he soon becomes able to know each particular card, which, when it is called for, he brings with an air of gayety and without confusion. * But of the attainments by which the dog has been distinguished that of learning to speak is the most extraordinary. The celebrated Leibnitz communicated a fact of this nature to the Royal Academy of France; and were it not that he asserts that he himself was a witness of the phenomenon, we should scarcely have dared to report the circumstance. The dog, from his account, could articulate about thirty words, but it was necessary that they should be first pronounced to him.

Dogs are found in all parts of the world, with the exception of a few groups of islands in the Southern Pacific Ocean. It is only in temperate climates that they preserve their ardour, courage, sagacity, and other talents. When transported to very hot countries they lose those qualities for which we admire them. These animals form an important article of food among many nations. In China, the Society Islands, &c., young puppies are considered a great delicacy, and are allowed by Europeans who have overcome their prejudices to be very sweet and palatable.—This taste for dog's flesh is of very early origin. The ancients regarded a young and fat dog as excellent food; and Hippocrates placed it on a footing with mutton and pork, and in another place observes that the flesh of a grown dog is wholesome and nourishing. The Romans admired sucking puppies, and sacrificed them to the gods as the most acceptable offering. Virgil has not thought the praise of dogs a subject unworthy of his pen, he recommends it to the husbandmen of Italy to pay particular attention to the rearing and training of dogs.[1]

The dog is born with its eyes closed; they do not become opened until the tenth or twelfth day; its teeth begin to change about the fourth month, and its growth is perfected in two years. The female generally has a litter of from six to twelve pups. The dog seldom lives beyond fifteen years. See BLOODHOUND, BULL-DOG, GREYHOUND, HOUND, MASTIFF, POINTER, SPANIEL, SHEPHERD'S DOG.

DOG, in law. By the English law dog-stealing is punishable by fine and imprisonment. By the Scotch law the penalty inflicted is only a fine. The owner of a dog which has done any injury to cattle or sheep belonging to another is, by the English law, liable in damages for the amount of injury done, whether the dog was previously known to be vicious or not, and even though the injury may have been done through no neglect on the part of the owner of the dog. By the Scotch law, however, in order to make good a claim for damages against the owner of a dog, it is necessary to prove not only that the animal was vicious in its habits but also that the owner knew it to be so. The same holds true with regard to injuries done to the person by a vicious dog. The Cruelty to Animals Act of 1854 (16 and 17 Vict. cap. lx.) prohibits, under a penalty, the use of dogs for purposes of draught in any part of the United Kingdom. It is necessary for any one keeping a dog above six months of age to pay an annual duty of 5*s*. for license to do so.

DOG-BANE (*Apocynum androsæmifolium*, Linn.), an American plant found from Canada to Carolina, belonging to the natural order Apocynaceæ, many of the plants of which are poisonous, and some drastic purgatives. The whole plant is lactescent: the root is intensely bitter and nauseous. It is highly valued by the southern Indians. The root is the most powerful part, and is employed by the American country physicians instead of ipecacuanha.

DOG-DAYS, the name applied by the ancients to a period of about forty days, the hottest season of the year, at the time of the heliacal rising of Sirius, the dog-star; that is, the time when it rose just before the sun. The heat, which is usually most oppressive at this season, was formerly ascribed to the conjunction of this star with the sun. We still retain the expression dog-days, as applied to the hottest season of the year, but owing to the precession of the equinoxes it is no longer the time of the heliacal rising of the dog-star.

DOGE (from the Latin *dux*, a leader or duke), formerly the title of the first magistrates in the Italian republics of Venice and Genoa. The first doge of Venice elected for life was Paolo Anafesto, in 697. The doge was first elected by the people, but afterwards by the great council. He held his dignity for life. His power became by degrees very limited. The dignity was abolished with the overthrow of the republic in 1797. In rank he was considered only equal to a duke, though the Republic of Venice was in dignity equal to a kingdom. In Genoa the office of doge was established in 1339. Here also the doge was at first elected by the people, but the dignity afterwards experienced numerous changes both in this and other respects. After the liberation of Genoa from the yoke of France by Andrea Doria the power belonging to this office was more systematically defined. A great and small council were created, and the duration of the office was limited to two years. After the overthrow of Genoa by the French in 1797 the dignity became extinct, although it was revived for a short time between 1802 and 1805. See GENOA and VENICE.

DOG-FISH, the popular name of several species of the genus *Squalus*, or shark, which are arranged by Cuvier under his sub-genus *Scyllium*. *S. canicula* and *S. catulus* are the two most common species, and those in particular to which the trivial name is given. In their general anatomy they differ but little from the other sub-genera of the great shark family, so well known for their ferocious and savage habits. The dog-fishes, though among the smallest of the tribe, manifest propensities equally cruel with those which have rendered the white shark and others so justly dreaded. Although seldom or never injurious to man, they commit great ravages in the fisheries, and where they abound constitute one of the greatest nuisances of the fishermen. Exceedingly voracious, and devouring almost everything they encounter, the mischief they occasion by taking the baits, and very often the hooks of the deep-sea lines, is very considerable, and not at all compensated for by the flesh of those which are captured. The sub-genus is characterized by having a short, obtuse snout; the nostrils situated near the mouth, and in a sinus or groove which runs along the edge of the upper lip, partially covered by two lobes or productions of the skin; teeth with a large triangular point, and a smaller one on each side.

The larger species, *S. canicula*, is distinguished by the following characters:—blackish brown, marked with numerous small blackish spots; length 3 to 5

[1] 'Nec tibi cura canum fuerit postrema; sed una
Velocis Spartæ catulos, acremque molossum,
Pasce sero pingui,' &c.—Georg. lib. iii. v. 404.

feet; inhabits the seas of almost every portion of the globe; swift, voracious, and very powerful; follows ships to feed upon the refuse which is thrown overboard; feeds on small fish and mollusca, and destroys great numbers of the young of its own species; breeds several times a year, and brings forth numerous individuals at a birth. The young are hatched from the egg in the complicated oviducts of the female, and are born alive. The eggs are similar to others of the family, and covered by a tough membranaceous integument. The skin of these fish is beset with numerous small asperities, which render it when dried well calculated for polishing wood and for other mechanical purposes. When alive it has a strong musky smell.

S. catulus, the lesser dog-fish, or rock-shark, resembles the former in its general appearance and habits, but the spots with which it is marked are larger and more scattered. It has very frequently been confounded with it, and by some authors described as the male; colour gray-brown, spots blackish, unequal, rounded; dorsal fins equal, nostrils bilobate; inhabits rocky bottoms, and preys principally on crustacea and shell-fish; produces eighteen or twenty at a time. The young evince their ferocious propensities very soon after birth, and are destroyed by the larger individuals of their own species.

The flesh of all the species is hard, dry, and unpalatable, requiring to be well soaked before it is eaten. Oil in considerable quantity is obtained from the liver. Poisonous effects are at certain times observed in consequence of eating the livers of dog-fish, and some cases are recorded in which the most distressing illness has been occasioned, followed by a heavy, torpid stupor of two or three days. The patients were afterwards affected by an erythrematous eruption, which extended all over the body, and which was terminated by a general peeling off of the skin.

DOGGER, a Dutch vessel navigated in the German Ocean; it is equipped with two masts, a main and a mizzen mast, and somewhat resembles a ketch. It is principally used for fishing on the Doggerbank.

DOGGERBANK, an extensive sand-bank of the German Ocean, celebrated for its cod-fishery. It commences about 36 miles east of Flamborough Head, and extends E.N.E. to within 60 miles of Jutland, in some places attaining a breadth of about 60 miles, though it terminates merely in a point. Where shallowest the water over it is 9 fathoms.

DOGGET'S COAT AND BADGE, a prize for a rowing-match on the Thames, which takes place every year on the 1st of August. It was instituted by one Thomas Dogget, who left a bequest for the purpose of founding this prize in commemoration of the accession of George I. to the throne of Great Britain, which happened on the 1st of Aug. 1715.

DOG-GRASS, or COUCH-GRASS (*Triticum repens*, Linn.), a perennial plant, with creeping roots, common in uncultivated grounds. The root is long, cylindrical, thin, knotty, white internally, yellowish and skinny externally, inodorous, of a farinaceous and sweet taste. This root is used in medicine. Dog-grass is employed in France as a demulcent.

DOGMAS, HISTORY OF, a branch of theology more attended to in the universities of the north of Germany than anywhere else. Its object is to exhibit in an historical way the origin and the changes of the various Christian systems of belief, showing what opinions were received by the various sects in different ages of Christianity, the sources of the different creeds, by what arguments they were attacked and supported, what degrees of importance were attached to them in different ages, the circumstances by which they were affected, and the mode in which the dogmas were combined into systems. The sources of this branch of history are the public creeds, the acts of councils and other ecclesiastical assemblies, letters and decrees of the heads of churches, liturgies and books of rituals, the works of the fathers of the church and of later ecclesiastical writers, as well as the narrations of contemporary historians. It is easily seen how important and interesting a study this is, teaching, as it does, modesty and forbearance in the support of particular opinions by showing the vast variety of those which have afforded subjects of bitter controversy at particular periods, and have then passed away into oblivion; and how much learning, industry, and critical acuteness are often required to make a thorough investigation of contested points of doctrine.

The distinction between this branch of history and ecclesiastical history is obvious. It is the same as exists between political history and the history of politics. Lectures on this subject are delivered in all the German universities. It is evident that the views taken of the history of dogmas must vary according to the sect to which the writer belongs, because it does not consist of a series of facts, but of the representation of the development of certain ideas, which must appear different, according to the idea which is considered by the writer as the most important. This is more or less the case with all history in proportion as the writer abandons mere relation for an analysis of the nature, the causes, and consequences of what he describes. Thus a republican would give a very different history of politics from a royalist, and a writer of the nineteenth century a different history of civilization from that which would be given by a writer of the seventeenth. Among the most important modern works on this subject are those by Hagenbach (Leipzig, two vols. 1840–41) and Baur (Tübingen, 1847).

DOGMATICS, a systematic arrangement of the articles of Christian faith (dogmas). It is the duty of the compiler of such a system to collect the religious ideas which are scattered through the Holy Scriptures, to explain, establish, and combine them. No one can successfully treat this important but difficult subject who is not well acquainted both with exegesis and philosophy. The first attempt to furnish a complete and coherent system of Christian dogmas was made by Origen in the third century, who was succeeded by Aur. Augustine in the fourth, by Isidore of Seville in the sixth, and by John of Damascus (see DAMASCENUS) in the eighth century. In the middle ages ingenious examinations of the Christian doctrines were made by the schoolmen; but agitating as they did subtle questions of little practical importance they loaded the science with useless refinements. Among the Protestants Melanchthon was the first who wrote a compendium of the Christian doctrine, which is still justly esteemed. This science has been successfully cultivated by the Protestant theologians since the last century.

DOGS, ISLE OF, or POPLAR MARSHES, in England, in the county of Middlesex, opposite Greenwich. The West India Docks are situated on the north part of it, and a little to the south of these it is intersected by the City Canal, now the South Dock. It derives its name from the circumstance of the king's hounds having been formerly kept here.

DOG'S-TAIL GRASS (*Cynosurus*), a genus of grasses. *Cynosurus cristatus* is a perennial found wild all over Great Britain in pastures, lawns, and parks. Its roots are long and wiry, and descending deep into the ground insure the herbage against suffering from drought. On this account it is regarded as the most valuable of all grasses when a large quantity of herbage is not required, as in pastures constantly fed down and in lawns kept closely mowed.

The straw and young ears are fresh and tender when young, but they soon become dry and exhausted as the grain approaches ripeness. These grains, commonly called seeds, being yellow, give rise to the provincial name of *gold seed* applied to the species. Among other British grasses this genus is readily known by its florets being mixed with hairy, comb-shaped bodies, commonly called bracts, but in reality spikelets, all the flowers of which are abortive. The crested appearance of the plant, to which its specific name is due, is caused by the peculiar arrangement of the comb-shaped spikelets, one above the other in regular succession.

DOG-STAR (*Sirius*), the star that gives their name to the dog-days (which see).

DOG-TOOTH SPAR, a form of calcic carbonate or calc-spar found in Derbyshire and other parts of England, and named from a supposed resemblance to a dog's tooth. It is a double six-sided pyramid with scalenohedral faces.

DOGWOOD (*Cornus sanguinea*) is a shrub belonging to the natural order Cornaceæ, and is a native of Europe, the north of Africa, and Britain. The leaves are 2 to 3 inches long, ovate, acute, smooth, and green on both surfaces, and the flowers are greenish-white, with an unpleasant smell. It bears dark purple berries, which are very bitter, and yield an excellent oil. Its wood, after a smothered combustion, affords excellent charcoal for gunpowder, and is also made into skewers for butchers, cogs for wheels, &c. The dogwood grows in woods and hedges, and as it thrives quite well under the shade of trees it is suitable for thickening plantations which have become open below. It derives its specific name *sanguinea*, 'bloody,' from the dark-red colour of the older branches. The American dogwood (*Cornus florida*) is a small tree, inhabiting America from the forty-third parallel of latitude to Florida, and extending westward beyond the Mississippi. The leaves are oval, entire, pointed, and whitish beneath; the flowers small, yellowish, and surrounded with an involucre composed of four large white leaves; the berries are red, and remain on the tree during a great part of the winter. Throughout a great part of the United States the large white involucres of the dogwood, together with the rose-coloured flowers of the Judas-tree (*Cercis Canadensis*), make a beautiful appearance in the spring. The dogwood attains the height of 20 or 30 feet, and has a trunk 8 or 10 inches in diameter; the wood is white, hard, of a fine texture, and much esteemed; it is used by cabinet-makers for inlaying, &c., different ornamental works; for the handles of tools, plane-stocks, &c., it is considered little inferior to box. The bark of several species of Cornus inhabiting Canada and the Northern States, possesses similar properties with the Peruvian bark. The bark of the root, stem, and branches tastes very much like this famous bark, for which it is often substituted. The *C. sericea* and *C. circinata*, Linn. (swamp and round-leaved dogwood), seem to possess the same properties as the preceding. *Cornus suecica* of the Scottish Highlands is tonic.

DOIT, a small copper coin anciently current in Scotland, and equal in value to one-twelfth (according to others, one-eighth) of a penny sterling. There was also in Lower Germany a small coin called *deut* (pronounced like *doit*) and *dütchen*, the diminutive of *deut*. In the Netherlands the coin is called *duyt* (pronounced in the same way).

DOL, a town, France, in the department of Ille-et-Vilaine, on a height overlooking marshy plains, 13 miles south-east of St. Malo; pop. 4230. It is an ancient place, and was once strongly fortified, though its walls and fosses are now in a very dilapidated state. It figured much during the middle ages and the wars of the league, and stood several sieges. The present town, built of dark-coloured granite, occasionally whitewashed, has by no means a prepossessing appearance, but the principal street is regularly built, and the church, once a cathedral, is the finest Gothic structure in Brittany. In 1793 an assault of the town by the republicans was repulsed by the Vendeans.

DOLABELLA, or DOLOBELLA, the name of a Roman family of the patrician Cornelia gens. One of its members was Publius Cornelius Dolabella, who made himself notorious by his profligacy. He was born about B.C. 70, and when a mere youth was guilty of crimes which would have cost him his life, had he not been saved by the exertions of Cicero. He afterwards married Cicero's daughter Tullia, who had previously had two husbands, but treated her so harshly that she was ultimately obliged to leave him. He possessed considerable talents, and at one time stood high in the opinion of Cicero, though there is reason to suppose that Cicero valued him chiefly for the assistance he expected him to give against Cæsar and his party. When disappointed in this expectation his eyes were opened, and he spoke of him with the utmost bitterness and contempt. Dolabella, when about to fall into the hands of his enemies, was slain at his own request by one of his soldiers, B.C. 43.

DOLABRA, the Latin name for a celt. See CELTS.

DOLCE, or DOLCEMENTE, in music, an instruction to the performer that the music is to be executed softly and sweetly.

DOLCI, CARLO (also CARLINO DOLCE), a celebrated painter of the Florentine school, was born at Florence in 1616, and died there in 1686. He was a disciple of Jacopo Vigniali, and his works, in Fiorillo's opinion, bear the character which his name implies. His subjects are principally heads of madonnas and saints, so mild and soft that they have been reproached with want of character. In minuteness and accuracy of finish he approaches the Dutch school. It must be confessed, however, that in his madonnas we discover frequent repetitions, and that his paintings betray that timidity and melancholy to which he was subject. His works are spread over all Europe; many of them are in Florence. Three of his best pieces are in the gallery at Dresden: namely, Cecilia, or the Organ-Player, Christ blessing the Bread and Wine (which has been very frequently engraved), and Herodias with the Head of John the Baptist. Among his chief productions also is Christ on the Mount of Olives, now at Paris.

DÔLE, a town in France, in the department of Jura, on a slope above the Doubs and the Rhone and Rhine Canal, 26 miles south-east of Dijon; pop. 11,093. It is of Roman origin, was long the capital of Franche Comté, and was a place of great strength and military importance, till its fortifications were dismantled in 1674. It is well built, and adorned with several fine fountains and promenades. Its most remarkable structures are the bridge over the Doubs, a lofty Gothic church supported by enormous pillars, an old Jesuit college, an ancient tower, used as a prison, a ruined castle built by Frederick Barbarossa, and the remains of a Roman amphitheatre, aqueducts, &c. The manufactures are Prussian blue, hosiery, ironware, leather, vinegar, optical instruments, &c.; and the trade is chiefly in grain, flour, timber, wine, brandy, coal, iron, millstones, and marble.

DOLERITE, the name given to a class of rocks, including dolerite proper, basalt, and a few others. Dolerite itself consists of labrador felspar and augite, with some titaniferous magnetic iron ore, and other minerals. It has a dark-gray colour, crystalline, and

small grained, sometimes porphyroidal. Specific gravity 3. Its average composition is silica 50, alumina 15, oxide of iron 15, lime 10, magnesia 5, and the rest potash, soda, and water.

It is found in great mountain masses, in beds and veins, in the Rhine district, in Iceland, in Guadaloupe, and other places.

DOLLAR, the denomination of various coins used in different states, and representing different values. This word corresponds to the German *thaler*, the Low-German *dahler*, the Danish *daler*, the Italian *tallero*. All these words, together with *dollar*, are derived from the name of the Bohemian town *Joachims-Thal* (Joachim's Valley), where, in 1518, the Count of Schlick coined silver pieces of an ounce weight. These, indeed, were not the first of the kind coined; yet, as they were numerous and very good, they became generally known by the name of *Joachimsthaler*, which is the German adjective of *Joachimsthal*, and also *Schlickenthaler*, from the name of the count. As these coins were in good repute, *thalers* were also coined in other countries, but of different value. Thus originated the *laub-thaler* (leaf-dollar), *Philipps-thaler*, the Swedish copper dollar, &c. In Russia a dollar is called *jephimock*, from *Joachim*. Dollars are used in the coinage of the United States of America, Mexico, and many South American states, Singapore, the Philippine Islands, and other East India states, most of which derived it from the old coinage of Spain. The gold dollar of the United States is worth about 4*s*. sterling; the Canadian dollar, 4*s*. 2*d*.; Mexican, 4*s*.; Peruvian, 3*s*. 1*d*.; Chilian, 4*s*.; Columbian, 4*s*. The Singapore dollar is worth about 4*s*. 3*d*. These values are subject to a good deal of fluctuation. In many states a paper-currency is used, which circulates at a much lower rate, and in some, where the coin has become old and defaced, its real value no longer corresponds with the nominal.

DOLLAR, a village, Scotland, county Clackmannan, 10 miles E. by N. Stirling, celebrated for its academy, founded by a Mr. John Macnab, a native of the parish, who, from being a poor ship-boy on board of a coasting trader, became a man of large fortune. He left a sum of £90,000, three per cents., for behoof of the Dollar Academy. The building, erected in 1819, is a handsome structure in the Grecian style, 186 feet in length and 63 feet in breadth, with a portico in front supported by six columns. The principal branches taught are English, writing and arithmetic, Latin, Greek, modern languages, geography, botany, drawing, and mathematics. There is also a female teacher of sewing and fancy work for the girls of the parish. The fees paid for education rise by a graduated scale, corresponding to the supposed ability of the parents to pay, so that the poorer classes obtain an excellent education for their families at 8*d*. per quarter for each class attended; but if more than one child be attending the school at a time, the second and others are admitted at half price. Within a short distance of Dollar are the ruins of an ancient residence of the noble family of Argyll, called Castle Campbell. Pop. 2524.

DOLLART, THE, a gulf of the German Ocean, at the mouth of the Ems, between the Dutch province of Groningen and the Hanoverian province of East Friesland. It was originally dry land, and was formed by irruptions of the sea, which took place in 1277 and 1530, overwhelming thirty-four large villages and numerous hamlets, and destroying thousands of human beings, besides much valuable property. A considerable extent of rich land has been regained by embankment.

DOLLOND, JOHN, an eminent optician of French descent, was born in Spitalfields in 1706. He was brought up a silk-weaver, and carried on that business for many years; but finding it little congenial to his taste, he devoted himself to the study of mathematics, optics, and astronomy, and at last joined his eldest son Peter, who was already established as an optician. His first attention was directed to the improvement of refracting telescopes, and he soon after communicated his discovery of the micrometer, as applied to the reflecting telescope. Mr. Dollond then engaged in a defence of Newton's doctrine of refraction against Euler, which correspondence was published in the Philosophical Transactions. He next constructed object-glasses, in which the refrangibility of the rays of light was corrected, to which the name of *achromatic* was given by Doctor Bevis, on account of their being free from the prismatic colours. In 1758 he obtained the Copley medal of the Royal Society. In 1761 he was elected F.R.S., and appointed optician to the king; but died of apoplexy in the same year.

DOLLOND, PETER, eldest son of the preceding, was born in 1730. In 1765 he communicated a paper to the Royal Society upon his improvement of telescopes, and another in 1772 on his additions to and alterations of Hadley's quadrant. He also gave a description of his equatorial instrument for correcting the errors arising in altitude from refraction. In 1789 he published an account of his father's improved telescopes. George Dollond, nephew of Peter, born 1774; died 1852, succeeded to his business, and in 1831 assisted in founding the Astronomical Society. The Dollonds are still among the chief opticians of London.

DOLMEN, a name given in France to what are known as cromlechs in this country. See CROMLECH.

DOLOMIEU, DÉODAT GUY SILVAIN TANCRÈDE GRATET DE, a French geologist and mineralogist, was born June 24, 1750, at Dolomieu (Isère), and was received into the order of the knights of Malta while yet a child. On his first cruise in the Mediterranean he killed one of the officers of his galley in a quarrel. He was tried at Malta, and condemned to lose the robe of the order; but the grand-master, considering his great youth, reprieved him; and the pope was at last prevailed on to give his consent to a full pardon. Dolomieu was in prison nine months, and during his confinement acquired a taste for poetry. He continued his studies at Metz, whither he was transferred as an officer of a regiment of carabineers in garrison at that place. The Duke de la Rochefoucault became acquainted with him there, and through his influence Dolomieu was made a corresponding member of the Academy of Sciences. In order to devote himself entirely to his studies Dolomieu left the military service and returned to Malta, whence he went to Portugal, in 1777, in the retinue of the Bailli de Rohan. He examined that country, visited Sicily and the neighbouring islands, Naples, and Mount Vesuvius, in 1781, travelled over the Pyrenees in 1782, and in 1783 passed through Calabria, which had just been desolated by an earthquake. In consequence of some secret communications which he made to the grand-master on his return being betrayed to the court of Naples, which was interested in them, he was forbidden to enter that kingdom, and experienced many difficulties in Malta. Leaving this island again he visited the mountains of Italy, the Tyrol, and the country of the Grisons. He returned once more to Malta for the purpose of bringing off his collection, and thence went to France in May, 1791, where he resided at Roche-Guyon, the estate of his friend the Duke de la Rochefoucault, who had fallen a victim to the revolutionary fury.

After the ninth Thermidor he renewed his geological excursions through France, always on foot, with

a hammer in his hand and a bag on his back. In 1796 he was appointed engineer and professor, and at the establishment of the Institute was made a member of that society. In these capacities he published several works relative to the theory of the earth and the nature of minerals. He eagerly seized the opportunity of visiting Egypt offered to him by the French expedition to that country. But the occupation of Malta on the way made him dissatisfied with the whole undertaking, and the situation of the army in Egypt soon condemned him to inactivity. In March, 1799, he embarked for Europe. On the passage the vessel sprang a leak, and only succeeded, after great efforts, in reaching the harbour of Tarentum. There the crew were treated as prisoners of war; and when the rest were set at liberty, Dolomieu was recognized and detained as a prisoner. During twenty-one months he suffered hardships and privations of every kind. Even books and writing materials were denied him. His firmness, however, sustained him. On the margins of two or three books, which he had contrived to conceal from the eyes of his sentinel, he wrote his treatise on mineralogical philosophy: his pen was a piece of wood, and the soot of his lamp supplied him with ink. In consequence of the peace concluded between France and Naples, March 15, 1801, he obtained his liberty, and received the professorship of mineralogy in the museum of natural history, which had become vacant by the death of Daubenton. His health, however, having been already undermined by his captivity, was entirely destroyed by a journey to Switzerland, Savoy, and Dauphiny, in 1801, and he died at Châteauneuf, November 28 of the same year. With a passionate love for geology Dolomieu united all the qualities, physical and moral, necessary for the successful study of his science. Among the works he has left are Voyages aux Iles de Lipari, &c. (1783); Sur le Tremblement de Terre de la Calabre (1784); Philosophie minéralogique (1802).

DOLOMITE, a mineral species, specimens of which occur crystallized, granular, compact and fine grained, columnar and flexible. A variety called *bitter spar*, and sometimes *rhomb spar*, is found in crystals having the form of a rhomboid, with angles varying from 106° 15′ to 107° 20′ and from 73° 45′ to 72° 40′. It cleaves with ease parallel to this form. Colour grayish, yellowish, or reddish-brown; hardness a little above that of calcareous spar, but is easily scratched with the knife; semi-transparent and very brittle; soluble in acids. It is found in steatite or soapstone, disseminated in crystals, varying in size from $\frac{3}{4}$ to $\frac{1}{4}$ inch in diameter. It has been found in the Lead Hills, in slate at Loch Lomond, in the Isle of Man, in the United States, and at Matea, near Tahiti. A second variety of this species is denominated *pearl spar*. It differs from bitter spar chiefly in the slightly curvilinear faces of its crystals, and in possessing a more shining, pearly lustre, and usually lighter shades of colour, being sometimes quite white. It is found principally in metallic veins accompanying the ores of lead and tin. The most abundant variety of the present species goes by the name of *dolomite*, or magnesian limestone. It is massive, or consists of fine crystalline grains, but slightly coherent, and of various shades of white. This variety is found at St. Gothard, in Italy, in the island of Iona, and in the island of Tenedos. It also constitutes beds of very great extent, and therefore belongs to the class of rocks. It abounds in the Apennines, the Tyrol, Switzerland, and Tuscany. It is frequently employed as a marble both in Europe and America. It is also employed for conversion into Epsom salt and carbonate of magnesium. It is composed of carbonate of calcium and carbonate of magnesium; but the relative quantity of the two is not exactly the same in all varieties. Its colour varies from gray or yellowish-white to yellowish-brown, the colour being due to iron. The best for building purposes is that in which the constituents are present in about equal proportions. The magnesian limestone of which the houses of Parliament are built was quarried in Derbyshire. By its decomposition it is conceived to form a good soil for agriculture.

DOLPHIN (*Delphinus*), a cetaceous animal, forming the type of a family (Delphinidæ) which includes also the porpoises and narwhal. The dolphin has been rendered famous by the tales related of it by the ancient writers; one of the most familiar of which is the fable of the musician Arion. There are several species of dolphins enumerated by naturalists. Those which occur commonly are *D. delphis*, or common dolphin, *D. rostratus*, and *D. tursio*. Dolphins are cosmopolite animals, inhabiting every sea from the equator to the poles, enduring equally well the extremes of heat or cold; they are gregarious, and swim with extraordinary velocity, outstripping in their course the fleetest vessels. During the electrical excitement of the atmosphere previous to changes of weather they are observed to be very active and vivacious, leaping considerable distances out of the water, and displaying, in their rapid movements, their uncommon muscular powers. The characters distinctive of the common dolphin are—black, beneath white; snout elongated, depressed; jaws with forty or forty-two curved, pointed teeth on each side; length 8 or 10 feet; flesh coarse, rank, and disagreeable (used by the Laplanders and the inhabitants of Greenland as food, but apt to produce sickness in persons who eat it for the first time); skin smooth, soft, with a layer of very white fat or blubber under it; liver large, yielding a larger quantity of oil than the blubber. The blow-hole is of a semilunar form, with a kind of valvular apparatus, and opens on the vertex, nearly over the eyes. The volume and development of the brain have induced naturalists to consider the dolphin an animal of unusual intelligence, and capable of feeling an attachment to man. Many stories are related of its docility, but, unfortunately, want confirmation. As the dolphin respires by lungs, it is of course compelled to come to the surface at short intervals to breathe.

The skeleton presents a modification of the principal bones of the higher mammifera, and the absence of many of minor importance. The structure of the ear renders the sense of hearing very acute, and the animal is observed to be attracted by regular or harmonious sounds. Owing to the flattened form of the cervical vertebræ, which amount to seven, the neck is very short, and the two first being immovably connected, the motion is very limited. A single bone, composed of or replacing those of the arm, is the support of the pectoral fins: it articulates with a peculiar shaped scapula, and the muscular arrangement is such as to give the fin great force. The whole number of vertebræ amounts to fifty-three, the sacrum being produced to support the tail. Compactness and strength are the characteristics of the genus, and the muscular powers of the tail are proverbial. The food of the dolphin consists of fish, mollusca, &c.; and shoals of dolphins are observed to hover round the herring and other fisheries in pursuit of their prey. When one of a shoal is struck, the rest are observed to pursue it immediately, probably for the purpose of devouring the wounded animal. One or two young are produced by the female, who suckles and watches them with great care and anxiety, long after they have acquired considerable size. It is stated by some authors that they cease growing at ten years of age,

and live eighty or a hundred years. The colour varies in different individuals: some are black, olive, or gray, and others mottled, or even quite white. The inhabitants of ancient Byzantium and Thrace pursued a regular fishery of the dolphin, destroying them with a kind of trident attached to a long line. Figures of this animal are found on antique coins, and very good representations of it occur on the Corinthian medals.

DOLPHIN, the name commonly but improperly given to a fish, the *Coryphæna hippuris*, a member of the family Scomberidæ, celebrated by travellers and poets in their marvellous recitals of its changes of colour when expiring. Such changes do occur, and are curious, but by no means so much so as romantic travellers would have us believe. The colour of the dolphin is silvery white, spotted with yellow. Body compressed, elongate, gradually decreasing from the front (which is very obtuse) to the tail; dorsal-fin extending from the nape nearly to the caudal; caudal-fin large, furcate; anal nearly reaching the base of the caudal; pectorals somewhat falciform; length usually 4 or 5 feet, though specimens of 6 feet in length are occasionally taken. Few fish are more agile, or swim with greater velocity. They abound within the tropics, and are found in all temperate latitudes. In the neighbourhood of the equator they commit great havoc in the immense shoals of flying-fish which inhabit those regions, and which constitute the principal food of the Coryphæna. It is remarkable, that in swallowing their prey the position of the captured fish is reversed, and it passes down the throat head foremost: by this manœuvre the fins are prevented from impeding its passage. The flesh of the dolphin is coarse and dry, but to those who have subsisted for a long while on salted provisions is very acceptable. At certain times, and in particular localities, the flesh acquires a deleterious quality, which has often proved fatal to persons who have eaten of it. The best antidote to its poisonous effect is a copious emetic, administered as soon as any symptom of poison is apparent. The dolphin bites freely at a hook baited with a piece of salted meat, or better with a flying-fish, and from its great strength affords fine sport to the fisherman.

DOMAIN, or DEMAIN, or DEMESNE (in French, *domaine*), in its popular sense, denotes the lord's manor place, with the lands thereto belonging, which he and his ancestors have from time to time kept in their own occupation. In England the domains of the crown (*terræ dominicales regis*) denote either the share reserved to the crown in the distribution of landed property at the time of the Conquest, or such as came to it afterwards, by forfeitures or other means. They are at present contracted within a very narrow compass, having been almost entirely granted to private subjects; and though this was often done in a most injudicious manner, it has been of great benefit to the nation, by diminishing the power of the crown, and making it dependent on the grants of Parliament; whilst in many other countries the wealth of the crown has rendered it independent, and strong enough to oppress the subjects and undertake wars injurious to the public welfare. The rents and profits of the demesne lands of the British crown are no longer kept separate, but are incorporated with the ordinary revenue. See CIVIL LIST.

The alienation of the domains in France, rendered necessary to reward powerful supporters, was the main cause of the fall of the Carlovingian dynasty. The succession of the Capets was likewise due to their great possessions, which rendered them the most powerful nobles in France. The policy of this house, particularly of Louis XI. of the Valois branch, in despoiling the great nobles, made them at length absolute masters of the kingdom, although at first their authority, beyond their own domains, was very feeble. The despotic power of the French monarchy reached its climax under Louis XIV., the most powerful of the Bourbon branch of the family. The nobility had now lost nearly all its feudal privileges, and could easily be rewarded by places at court, appointments in the public services, and pensions out of the national revenue. But while subservient to the crown, the aristocracy remained completely isolated in interest and feeling from the people, which had been growing in power, and which finally overthrew both it and the crown. In most European countries the same struggle, modified by local circumstances, took place as in France and England between the crown, the nobles, and the people; and in all such cases the conservation of the domains of the crown and of the great nobles respectively had an important influence on the issue. Napoleon, who endeavoured as much as possible to revive the traditions and institutions of the monarchy, had also a *domaine extraordinaire* (law of Jan. 30, 1810), which consisted of his acquisitions by conquests, and were kept entirely at his disposal; these supplied the means of donations to his generals, &c. The domaine extraordinaire was likewise retained by the Bourbons (law of May 22, 1816). The administration of these donations was conducted with great wisdom; and Napoleon, as Las Cases relates, dwelt with pleasure on this branch of his government.

DOMAT (DOUMAT), JEAN, an eminent French lawyer, who was born at Clermont, Auvergne, in 1625. He was king's advocate in the presidial court of Clermont for thirty years. He died at Paris in 1696. His treatise entitled Les Loix civiles, dans leur Ordre naturel, appeared in 1680–97; Legum delectus, 1703. An improved edition of his works was published in 1777, and there is an English translation of them, 1720, two vols. folio.

DOMBROWSKI, JAN HENRYK, a Polish general, distinguished in the wars of Napoleon, was born in 1755 in the duchy of Posen. In 1788 he was captain of the guards in the corps of the Elector of Saxony. In the insurrection of 1794 he defended Warsaw against the Prussians. He entered the service of France in 1796, joined the Polish legion under Bonaparte in Italy, and served under Macdonald as general of division in the campaign of 1806. After the battle of Jena he was intrusted with the organization of the district of Posen. In 1809 he repulsed the Russians, who had invaded the grand-duchy of Warsaw. He took a distinguished part in the campaign of 1812, and was wounded at the Beresina, Nov. 26, 1812. He also distinguished himself at the battle of Leipzig, and in 1814 he re-organized the Polish army in the service of France. Alexander I. recalled him to Poland, and made him a senator in 1815. He died in 1818. His last years were employed in preparing a History of the Polish Legion in Italy, which was published in Paris, two vols. 8vo, in 1829.

DOME. See CUPOLA.

DOME-BOOK, an authoritative compilation of the laws and local customs of England made under the direction of King Alfred. It is said to have been extant in the reign of Edward IV., and is now lost.

DOMENICHINO, the name, among artists, of *Domenico Zampieri*, a painter of great eminence, of the Lombard school, born at Bologna in 1581 or 1582. He was sent to study first with Calvart, and afterwards with the Carracci. From the slowness of his execution he was named, by his fellow-students, the *ox of painting;* but Annibal Carracci predicted that the ox would 'plough a fruitful field.' Having contracted a great friendship for Albano he joined him

at Rome, and his former master, Annibal Carracci, jealous of Guido, procured for him the execution of one of the pictures for a Roman church which had been promised to that great painter. It was a custom with Domenichino to assume, for a time, the passion he was depicting; so that, while working by himself, he was often heard to laugh, weep, and talk aloud, in a manner that would have induced a stranger to suppose him a lunatic. The consequence, however, was, that few painters have surpassed him in lively representation. His Communion of St. Jerome has been considered, by some connoisseurs, inferior only to the Transfiguration of Raphael; and the History of Apollo, which he painted in ten frescoes for Cardinal Aldobrandini, is also much admired. Although a modest and inoffensive man, his merit excited so much envy that he retired to his native city, where he married (1619), and employed himself two years on his famous picture of the Rosary. He was afterwards recalled to Rome (1621) by Gregory XV., who created him his first painter and architect of the Vatican. Losing this post after the pope's death, he accepted an invitation to Naples, to paint the chapel of St. Januarius. But here he encountered a jealousy so rancorous that his life became altogether imbittered by it; and so great was his dread of poison, that he prepared all his eatables with his own hand. He died at Naples, April 15, 1641, at the age of sixty. Domenichino, who understood every branch of his art, produced nothing excellent without study and labour; but in consequence of his great premeditation, no painter has given his pieces more of the properties belonging to the subject. At the same time his designs are correct; and he succeeded equally in the grand and the tender. Nearly fifty of his pieces have been engraved.

DOMESDAY (or DOOMSDAY) BOOK is the record of a statistical survey of England, made by royal authority in the reign of William the Conqueror. The origin of the name has been much disputed, and nothing beyond conjecture can be arrived at in regard to it. Popularly it has often been supposed to be associated with the final day of judgment, but this is merely a mistake arising from the sound of the name. There was a dome-book composed in the reign of King Alfred, which contained a collection of the laws and customs of the kingdom, and the most probable conjecture as to the origin of the title of the record now under consideration is, that it contained the authoritative data on which legal decisions in regard to land and other collateral property were to be given. The institution of a general survey of the kingdom, with a view to the compilation of an official record, was determined on at a council held at Gloucester in 1085; the survey was ordered at Christmas, 1085, and completed in the following year, a remarkable instance of administrative vigour. The survey was made by commissioners appointed by the king, who collected the particulars at inquests from a sworn jury, consisting of sheriffs, lords of manors, presbyters, bailiffs, villains; all the classes, in short, interested in the matter. The information collected consisted in specifications of the extent of land in each district, their proprietors, tenure, and value; the state of culture, namely, the quantity of meadow, pasture, wood, and arable land; in some counties the number of tenants, villains, *cotarii* and *servi;* even the sheep and cattle on the different estates were taken, but these were not entered in the permanent record. The particulars of tenure, value, &c., were taken for three different periods: 1st, as held in the time of Edward the Confessor; 2d, as bestowed by King William; 3d, as valued at the period of the survey. The survey was general, but the northern counties, Northumberland, Cumberland, Westmoreland, and Durham were not included, with the exception that the south part of Westmoreland and Cumberland were included in the West Riding of Yorkshire. The north part of Lancashire, including Furness, was also included in the West Riding, and the south of Lancashire in Cheshire. The original Domesday Book is preserved in the record office. It consists of two volumes: one folio, containing the statistics of thirty-one counties; one quarto, containing the returns for Essex, Norfolk, and Suffolk. The information contained in these volumes is of very great historical value, as, though imperfect in some respects, it is unequalled in fulness and accuracy as a statistical record for the period at which it was taken. The republication of Domesday Book, in consequence of an address from the House of Lords, was undertaken by order of George III. in 1767, and completed under the superintendence of Abraham Farley in 1783. Special types were cast to imitate the abbreviations of the original, and it was made as near a facsimile as possible. The types were destroyed by fire in 1808. Two supplementary volumes were published by the commissioners on public records in 1816–18. The one contained an introduction and index by Sir Henry Ellis of the British Museum, the other some supplementary records, including a survey of the see of Durham made in 1183. Perfect facsimiles of the whole book in photozincography, undertaken in 1861 by Sir Henry James of the Ordnance Survey Office, Southampton, were completed in 1864–65.

DOMFRONT, a town, France, department of Orne, picturesquely situated on a steep rock above the Varenne, 35 miles W.N.W. of Alençon. It was founded in the eleventh century, and became an important stronghold, the possession of which was often contested, both in the early wars with the English and those of the League. It consists of narrow, crooked, steep, and ill-built streets, and has no objects worthy of notice except an ancient church and ruined castle. Pop. 4866.

DOMICILE, in law, the place where a person has a home or established residence. For many purposes of law it becomes of importance to determine the domicile of the individual concerned, and this, on account of the frequent changes of residence which take place, is often a very difficult matter. Thus the law of domicile is one of the most complicated points in jurisprudence, and gives rise to numerous cases of great intricacy, which are often decided in the highest courts by a bare majority of judges. In all countries importance is attached to the domicile, and there are general principles of law recognized regarding it; but the laws of different countries necessarily differ in details, and even the English and Scotch laws are not alike. It is a general rule of law that movable property follows the person of the owner, and is disposed of on his decease according to the law of the country in which he was domiciled at the time of his death, and not according to the law of the country in which the property is situated. Domicile is often also an indispensable condition in determining the validity of marriage, and the legitimacy of children. The efficacy of legal citations, which may involve the competency of legal proceedings of various kinds, may also be affected by an error as to the domicile of the party cited. Even the right to sue, or the liability to be sued, may depend on the possession or non-possession of a domicile.

The law of domicile is not alike for all these purposes. It is generally recognized that for certain purposes a temporary domicile may suffice, but in questions of marriage and succession to property it is the permanent domicile that determines the decision. By the law of England a permanent domicile must be constituted by two conditions, actual resi-

dence and the intention to make it the home of the party. It must be the permanent home from which he absents himself, only with the intention of returning to it. A domicile may be constituted in three ways: first, by birth; second, by choice; and third, by the operation of the law. It is a legal principal that the domicile of a husband is that of his wife. When a person domiciled in one country goes to another he does not lose his domicile till he has acquired a new one, even if it should not be his intention to return to the first. By the law of Scotland, at least, a residence within the jurisdiction of a judge for forty days establishes a domicile, to the effect of giving validity to a legal citation, but this temporary domicile does not affect the legal privileges attached to the permanent domicile of the party. To obviate inconveniences resulting from the application of the law of domicile to the disposition of property of persons dying abroad, two acts, 24 and 25 Vict. cap. cxiv. cxxi., were passed. The first provides that, as regards personal estate, a will shall be valid in any part of the United Kingdom if made according to the forms of the place where it was made, of the place where the deceased was domiciled at the time of making it, or of the part of her majesty's dominions where he had his domicile of origin. The other permits her majesty to regulate with foreign states the law of acquiring domicile in foreign countries, according to the provisions contained in the act, and to proclaim such regulations by the publication in the Gazette of an order in council, which shall have the effect of law. The principle of domicile declared in the act is that no subject shall acquire a foreign domicile unless he has been resident in the country for an entire year, and has deposited in a public office a declaration of his intention of becoming domiciled therein.

When a company has more than one domicile, proceedings in bankruptcy in any of its domiciles may comprehend its whole personal estate.

The domicile of a bill of exchange is the place where the acceptor makes it payable. If a bill is not domiciled it is payable at the domicile of the acceptor, which is his place of business, not of residence, as even a single acceptor, by keeping a place of business, constitutes himself a mercantile firm, and accepts bills as a firm, not as an individual. But the acceptor may name a domicile, usually a banker's, on the bill, and then payment must be demanded at the domicile, and the legal forms of noting and protesting complied with before further proceedings can be taken.

DOMINANT, in music, is the fifth note of the common diatonic scale.

DOMINGO, San, a fortified city, Hayti, and the metropolis of the eastern division of that island, on the south-east coast, at the mouth of the Ozama. It is surrounded by a thick wall; the houses are neatly built, the streets straight and spacious, with footways of brick. There are here a fine cathedral, some handsome churches and convents, an hospital, barrack, and arsenal. The fortifications by which the town is defended are judiciously constructed. The harbour is commodious, and ships may lie close to the shore to take in their lading. San Domingo had formerly a considerable trade in jerked beef, cattle, and hides, but it is now very limited. This is the oldest European city in the New World, having been founded in 1502. Its prosperity was greatest in the sixteenth century. Pop. about 15,000.

DOMINGO, St. See Hayti.

DOMINIC, Saint, the founder of the order of the Dominicans, was born in 1170 at Calahorra, in Old Castile. He was sent to the public school of Palencia at the age of fourteen, and distinguished himself for diligence, piety, and charity to the poor. He was admitted a canon in 1198 by the Bishop of Osma, who wished to reform his chapter, and he accompanied the bishop on a voyage to France to negotiate a marriage for the son of King Alphonso. On his return he obtained from Pope Innocent III., on his own application, a mission to preach against the Albigenses. During his mission to Languedoc he founded in 1215 the order which bears his name. When he had procured its approval from the pope he established himself at Rome in the convent of St. Sixtus, and was created Master of the Sacred Palace about 1216, with the censorship of books and dogmas, and the right of conferring the degrees of doctor and preacher. After numerous voyages to establish and extend his order he retired to the convent of St. Nicholas at Boulogne, where he died in 1221, in the practices of austere piety. He was canonized by Pope Gregory IX. in 1234. St. Dominic is usually considered the founder of the Inquisition, which is supposed to have originated with his mission to the Albigenses; but his claim is denied, on the ground that two Cistercian monks were appointed inquisitors in 1198.

DOMINICA, a British West India island, one of the Lesser Antilles, Leeward group, between the islands of Martinique and Guadeloupe, from both of which it is nearly equidistant, 25 to 30 miles. It is about 29 miles in length, north to south, and 12 miles in breadth east to west; area, 186,436 acres. It is rugged and mountainous, but it contains many fertile valleys. The slopes of the mountains, which occupy the whole interior of the island from north to south, are very steep, and terminate in bold and precipitous coasts. The island is of volcanic origin, contains several solfataras, and has numerous sulphurous and thermal springs. The latter are said to be sufficiently hot to coagulate an egg, and are believed to possess great medicinal virtues. Dominica is one of the best watered of the Leeward Islands, having numerous streams. The soil is better adapted for the production of coffee than sugar. The shores are but little indented, and are entirely without harbours; but on the west side there are several good anchorages and bays, the coast being all along bold and clear of danger. The principal bay is Prince Rupert's, at the north-west end of the island—much resorted to for its safety and other conveniences. The woods afford large supplies of excellent timber. The principal produce consists of rum, coffee, sugar, molasses, cacao, arrow-root, and wool, honey and wax, the produce of European bees brought to the island, which now swarm in the woods. The government is under the governor-in-chief of the Leeward Islands, administered by a lieutenant-governor, a legislative council, an executive council, and a representative assembly. The principal towns are Roseau, or Charlotte Town, on the south-west side; and Portsmouth, or Prince Rupert's Town, considerably to the north of Roseau. Dominica was discovered by Columbus in 1493, and was claimed alternately by England, France, and Spain; was ceded to Great Britain in 1763, taken by the French in 1778 and 1781, restored in 1783, and again attacked unsuccessfully in 1805. Pop. in 1870, 28,517.

DOMINICAL LETTER, in chronology, properly called Sunday letter, one of the seven letters of the alphabet, A B C D E F G, used in almanacs, ephemerides, &c., to designate the Sundays throughout the year. The first seven letters of the alphabet are placed to show on what days of the week the days of the month fall throughout the year. And because one of those seven letters must necessarily stand against Sunday, it is printed in a capital form, and called the *dominical letter;* the other six being inserted

in different characters, to denote the other six days of the week. Now, since a common Julian year contains 365 days, if this number be divided by seven (the number of days in a week), there will remain one day. If there had been no remainder it is obvious the year would constantly begin on the same day of the week; but since one remains, it is plain that the ordinary year must begin and end on the same day of the week: and therefore the next year will begin on the day following. Hence when January begins on Sunday, A is the dominical or Sunday letter for that year; then, because the next year begins on Monday, the Sunday will fall on the seventh day, to which is annexed the seventh letter, G, which, therefore, will be the dominical letter for all that year; and as the third year will begin on Tuesday, the Sunday will fall on the sixth day; therefore F will be the Sunday letter for that year. Whence it is evident that the Sunday letters will go annually in retrograde order, thus, G, F, E, D, C, B, A; and in the course of seven years, if they were all common ones, the same days of the week and dominical letters would return to the same days of the months. But because there are 366 days in a leap-year, if the number be divided by seven, there will remain two days over and above the fifty-two weeks of which the year consists. And therefore, if the leap-year begins on Sunday, it will end on Monday; and as the year will begin on Tuesday, the first Sunday thereof must fall on the 6th of January, to which is annexed the letter F, and not G, as in common years. By this means, the leap-year returning every fourth year, the order of the dominical letters is interrupted, and the series cannot return to its first state till after four times seven, or twenty-eight years; and then the same days of the month return in order to the same days of the week as before. The initial letters of the days of the week are now generally substituted in almanacs for dominical letters.

DOMINICANS, called also *predicants*, or *preaching friars* (*prædicatores*), derived their name from their founder, St. Dominic. At their origin (1215, at Toulouse) they were governed by the rule of St. Augustine; and the principal object of their institution was to preach against heretics. They retained these rules and regulations after they had adopted a white habit, similar to that of the Carthusians, and the character of monks in 1219. They were called *Jacobins* in France, because their first convent at Paris was in the *Rue St. Jacques*.

The Dominican nuns were established in 1206 by St. Dominic, and increased in numbers after 1218, when he founded a nunnery in Rome. They follow the same rules; they are required also to labour, which is not expected of the friars, on account of their higher duties.

A third establishment of St. Dominic was the military order of Christ, originally composed of knights and noblemen, whose duty it was to wage war against heretics. After the death of the founder this became the order of the penitents of St. Dominic, for both sexes, and constituted the third order of Dominicans. These Tertiarians, without making any solemn vows, had the assurance of great spiritual privileges through the observance of a few fasts and prayers; they continued, also, in the enjoyment of their civil and domestic relations. Some few companies of Dominican sisters of the third order, particularly in Italy, united in a monastic life, and became regular nuns; the most celebrated of whom is St. Catharine of Sienna. That they might devote themselves with success to the promulgation and establishment of the Catholic faith, which was, in fact, the object of their institution, and the first proof of their zeal for which they gave in the extirpation of the Albigenses, the Dominicans received, in 1272, the privileges of a mendicant order, which contributed greatly to their rapid increase. They filled not only Europe, but the coasts of Asia, Africa, and America, with their monasteries and missionaries. Their strictly monarchical constitution, which connected all the provinces and congregations of their order under one general, secured their permanent existence, and a unity in their successful efforts to obtain influence in church and state. They made themselves useful by preaching, which was much neglected at the period of their establishment, and by their missions; respectable and serviceable to the church by the distinguished scholars they produced, such as Albertus Magnus and Thomas Aquinas; and formidable as managers of the Inquisition, which was committed exclusively to them in Spain, Portugal, and Italy.

After they had obtained permission to receive donations in 1425, notwithstanding their original vow of absolute poverty, they ceased to belong to the mendicants, and in the enjoyment of rich benefices, superior to other orders, they paid more attention to politics and theological science. They gave to kings father-confessors, to universities instructors, and to the pious rosaries; and for all they were richly rewarded. From their establishment they found dangerous rivals in the Franciscans, and engaged in contests with them, the heat and bitterness of which have been perpetuated by the hostilities of the Thomists and Scotists, and have continued even to modern times.

These two orders divided the honour of ruling in church and state till the sixteenth century, when the Jesuits gradually superseded them in the schools and courts, and they fell back again to their original destination. They obtained new importance by the censorship of books, which was committed, in 1620, to the master of the sacred palace at Rome, an office held by St. Dominic himself, and which, from this time, has always been conferred on a Dominican. What the Reformation took from them in Europe, the activity of their missions in America and the East Indies restored. In the eighteenth century the order comprised more than 1000 monasteries, divided into forty-five provinces and twelve congregations. To the latter belonged the nuns of the holy sacrament, in Marseilles, established by Le Quien, in 1636, under the strictest rules. They dress in black, with white mantles and veils, while the Dominican nuns wear white, with black mantles and veils. The Dominican order is now flourishing only in Austria, France, Italy, Switzerland, and America. The nuns of the order have not many convents. Las Casas belonged to this order.

DOMINO, formerly a dress worn by priests in the winter, which, reaching no lower than the shoulders, served to protect the face and head from the weather. At present it is a masquerade dress worn by gentlemen and ladies, consisting of a long silk mantle with wide sleeves and a masquing hood.

DOMINOES, a game played with small flat rectangular pieces of ivory, about twice as long as they are broad. They are marked with spots varying in number. Each domino has two sets of spots ranging in number from 0 up to 12, which are distributed in all possible combinations—0–0, 0–1, 0–2, 0–3, &c., to 0–12; then 1–1, 1–2, 2–3, 2–4, and so on up to 12–12. Those which have the two sets of spots alike—2–2, 3–3, &c., are called double twos, double threes, &c. The game is to appearance remarkably simple, but is played in a variety of ways. The general principle of all the varieties is that when one player leads by laying down a domino, the next must follow by placing alongside of it another which has the same number of spots on one of its sides. Thus if the first player lays

down 6–4, the second may reply with 4–8, or 6–7, &c.; in the former case he must turn in the 4, placing it beside the 4 of the first domino, so that the numbers remaining out will be 6–8; in the latter case he must turn in the 6 to the 6 in like manner, leaving 4–7, to which his opponent must now respond. The player who cannot follow suit loses his turn; and as the object of the game, modified by special conditions in the different varieties, is to get rid of all the dominoes in hand, or to hold fewer spots than your opponent when the game is exhausted by neither being able to play, it is a special point of play to shut out your opponent when it can be done without injury to your own hand. In some varieties of the game two players only can enter, others admit of an indefinite number.

DOMITIAN, or in full TITUS FLAVIUS DOMITIANUS AUGUSTUS, son of Vespasian, and brother of Titus, was born A.D. 51, and made himself odious, even in youth, by his indolence and voluptuousness, and his cruel, malignant, and suspicious temper. Rome trembled when, on his brother's death, he obtained the diadem (A.D. 81). At first, indeed, he deceived the people by acts of kindness, good laws, and a show of justice, so that their fears vanished; but he soon returned to his former excesses and cruelty. He first caused his kinsman, Flavius Sabinus, to be put to death, though entirely innocent. No less vain than cruel, while his general, Agricola, was victorious over the Caledonians in Britain, he made a ridiculous expedition against the Catti, returned speedily to Rome without having effected anything, and carried a multitude of slaves, dressed like Germans, in triumph to the city. Agricola's victories exciting his jealousy, he recalled that general to Rome, and kept him in total inactivity. At the same time he spread terror through Rome by the execution of a great number of the first citizens. He gave himself up to every excess, and to the meanest avarice. He at last conceived the mad idea of arrogating divine honours to himself, assumed the titles of Lord and God, and claimed to be a son of Minerva. His principal amusement consisted in the shows of the circus. In the year 86 the bloody war with the Dacians began, which was carried on with various success, and terminated (A.D. 90) by a peace bought by the promise of paying a certain tribute. Notwithstanding this, Domitian celebrated a grand triumph on the occasion. The misery of the people was, meanwhile, continually increasing; and after the revival of the law against high treason, which enabled almost anything to be construed into this crime, no one was secure of his property or his life. The tyrant once made a feast on purpose to terrify the senators and knights. They were assembled in a dark hall, in which were coffins with the names of the individuals invited inscribed upon them; suddenly the doors opened, and a troop of naked men, painted black, with drawn swords and blazing torches, rushed in, and danced about the guests until the emperor had sufficiently enjoyed their terror, when he dismissed the supposed executioners. The fears of the tyrant increased his cruelty. A paper fell into the hands of his wife, the infamous Domitia, in which she found her own name, and those of the two commanders of the pretorian guards, with many others, noted down by the emperor as victims. This discovery induced her to conspire against him with some of those about the palace, and he was stabbed in his bedroom by a freedman named Stephanus, A.D. 96. He had reigned fifteen years, and was forty-five years old. Domitian built the most magnificent temple in Rome.

DOMITZ, a town, Mecklenburg-Schwerin, on the Elbe, at the confluence of the Elde, 34 miles south by west of Schwerin; pop. 2234. It is defended by a citadel on an island in the Elbe, and surrounded on its south and east sides by a rampart flanked with bastions. It has some shipping, and a considerable trade, but often suffers from inundation.

DOMO, or DOMO D'OSSOLA (ancient *Oscela*), a town of Italy, in the province of Novara, on the right bank of the Toce, and in the centre of a plain on the great Simplon road, 78 miles north by east of Turin. It contains several well-built streets and squares, a handsome church of three naves, supported by rows of pillars and adorned by fine frescoes; a college, and an old castle. Its two annual fairs last each eight days. Pop. 2241.

DOMREMY LA PUCELLA, the birth-place of Joan of Arc, a small village in the department of the Vosges, in France, not far from Vaucouleurs, in the department of the Meuse, in a fruitful region. The house is still shown here in which the heroine was born. In the neighbourhood is the monument erected to her memory by the prefect of the department of the Vosges, with her marble bust, which was solemnly consecrated September 10, 1820. A free school is established there for the instruction of girls.

DON (ancient, *Tanaïs*), a river of Russia, which issues from Lake Ivan-Ozera, in the government of Tula; lat. 53° 47′ N.; lon. 38° 15′ E., and flows S.E. through governments Riazan, Tambov, Voronej, and Don Cossacks, to within 37 miles of the Volga, where it turns abruptly S.W. for 236 miles, and falls into the Sea of Azof, near the town of Azof, by three mouths, only one of which is navigable; whole course nearly 900 miles. The chief tributaries are: right bank, the Donetz and Voronej; left, the Khoper and Manitsch. The delta of the Don is an expanse of sandy flats, running 28 miles up, and 22 miles wide at the coast line. Notwithstanding the shallowness of the channel, no vessels drawing 6 feet water being able to get up to more than about 30 miles, namely, to Rostoff or Axaï, the Don has by far the most busy trade of all the rivers of South Russia. The navigation is nearly all downward, indeed; and can only take place during spring-floods; nevertheless, by means of its lower course, in connection with the Volga, the south provinces of Russia receive most of the Siberian produce they need, and also the manufactures they require from the interior of the empire. The extensive and productive fisheries of the Don likewise add much to the traffic seen upon its lower waters.

DON, a river of Yorkshire, England, which rises near Cheshire, flows E. and S.E., and joins the Ouse after a course of about 55 miles. By artificial cuttings and canals it has been rendered navigable for vessels of 50 tons to Sheffield, a distance of about 40 miles.

DON, a river, Scotland, county Aberdeen, rising in several small streams flowing from the hills between counties Aberdeen and Banff. It flows tortuously E. through the whole breadth of Aberdeenshire, and falls into the North Sea 2 miles north of Aberdeen, after a total course of 62 miles. Its principal tributary is the Urie, which joins it at Inverury. Its salmon fisheries are of considerable value.

DON (Latin, *dominus*), a Spanish title of honour, originally given only to the highest nobility, afterwards to all the nobles, and finally used indiscriminately as a title of courtesy. It corresponds with the Portuguese Dom. During the Spanish occupation it was introduced and became naturalized in some parts of Italy, particularly in Naples.

DON, DAVID, a botanist of some eminence, born at Forfar, in Scotland, in 1800, worked for some time under his father, who had obtained the charge of the botanic garden at Edinburgh, and by his knowledge of botany attracted the attention of some gentlemen,

who furnished him with the means of attending classes in the university. In 1819 he went to London and published a work entitled, Descriptions of Several New or Rare Native Plants found in Scotland, which helped to bring him into notice. In 1822 he was made librarian to the Linnean Society, an office which gave him great opportunities of improving his botanical knowledge. In 1825 he published descriptions of several species of Nepaul plants, under the title of Prodromus Floræ Nepalensis, and for many years every volume of the Linnean Transactions contained one or more of his communications. In 1836 he obtained the chair of botany in King's College, London, and held it till his death, which occurred on 8th Dec. 1840. He was a zealous teacher, and much esteemed by his students, but was deficient in the facility and perspicuity necessary to form a popular lecturer.

DONAGHADEE, a seaport and market town, Ireland, county Down. It lies on the Irish Channel, 16 miles east by north of Belfast. The portion of the town next the shore, built in the form of a crescent, with the houses whitewashed, presents a cheerful and pleasing appearance. There are here a spacious harbour, pier, and light-house, with a stationary red light. The harbour is a large artificial basin of 7 acres, and is capable of admitting, at low water, vessels drawing 16 feet; but is little used, Belfast monopolizing the greater portion of the trade; even the post-office steam packets no longer ply between this port and Portpatrick, in Scotland. Its principal exports are live cattle and pigs; its chief imports, coal and timber. Many of the females are employed in embroidering muslin for Glasgow houses. Pop. 2664.

DONALDSON, JOHN WILLIAM, a distinguished English scholar, was born in London in 1811, and after studying in the University of London, where he took the highest Greek prize in 1830, he graduated as B.A. in 1834, in Trinity College, Cambridge, taking the second place in the classical tripos. He was elected a fellow in the following year, and henceforth directed himself to the study of comparative philology, which had already made great progress in Germany, though receiving but little attention in this country. His first work was The Theatre of the Greeks, which has passed through many editions. In 1839 he published The New Cratylus, or Contributions to a more Accurate Knowledge of the Greek Language, which was the first systematic attempt to bring the philological literature of the Continent within the reach of the English student. Having married and taken holy orders he accepted the head-mastership of the grammar-school of Bury-St.-Edmonds, where he resided for some years. Here he continued his contributions to classical literature, and was selected by the Society for the Diffusion of Useful Knowledge to continue the History of Greek Literature left unfinished by the death of K. O. Müller. About five years before his death he removed to Cambridge, and in 1858 the senate of the University of London appointed him classical examiner in conjunction with Dr. William Smith. He died in London on 10th February, 1861. Besides a new and improved edition (the third) of The New Cratylus, in 1859, he wrote Jashar, a Latin work of theological controversy highly appreciated in Germany (1854); Comparative Grammar of the Hebrew Language (1853); Greek Grammar (1848); Latin Grammar (1852).

DONALDSON'S HOSPITAL. See EDINBURGH.

DONATELLO (properly, *Donato di Betto Bardi*), one of the revivers of the art of sculpture in Italy, was born at Florence between 1382 and 1387, of a family which counts several distinguished literati among its members, and repeatedly, from the middle of the sixteenth century, gave a doge to Venice. He was brought up in the house of Martelli. His first great works in marble were statues of St. Peter and St. Mark, in the church of St. Michael in his native town; his own favourite piece was the statue of an old man in senator's dress placed on the clock-tower of the same church, and known by the name of Zuccone, or Bald-head. For the church of St. John he executed a Penitent Magdalen in wood; but in this branch of art he was surpassed by his scholar and friend, Brunelleschi, with whom he made a journey to Rome to acquaint himself with its treasures. After his return to Florence he executed for his patrons, Cosmo and Lorenzo de' Medici, a marble monument to their father and mother, which excited universal admiration. One of the principal ornaments of St. Michael's church is a marble statue of St. George, surpassed by no similar statue which has since been erected. Among his other leading works are statues of St. John, Judith and Holofernes, David, and St. Cecilia. Notwithstanding his strictness he was honoured as a father by all his scholars, among whom were Desiderio da Settignano, Benedetto di Majano, and Nanni d'Antonio. He asked a high price for his works, and nothing made him more indignant than the huckstering of amateurs. He is said to have destroyed several of his pieces, and particularly a statue of John the Baptist for the cathedral of Sienna, because the price was grudged. He died at Florence in 1466.

DONATIO MORTIS CAUSA is a gift of personal property made in prospect of the death of the donor and consummated by that event. It differs in two points from a legacy. It is independent of probate, and does not require the consent of the executor to its enjoyment. A delivery, either actual or symbolical, is necessary.

DONATISTS, the followers of Donatus, a Numidian bishop, who, with his friends, refusing, in 311, in a contested election of a bishop, to recognize the Traditors (that is, the ecclesiastics who had given up the sacred books to the heathen magistrates during the periods of persecution) as eligible to office in the church, quitted the Roman Church with his friends, and founded a peculiar sect, which refused to receive Christians of other sects without a second baptism. Their strictness was increased by the adoption of the Novatian principle of excommunicating apostates, or gross offenders, and declaring the most perfect blamelessness of life and doctrine essential to the members of the true church. This sect prevailed in the Christian provinces of Northern Africa, and in A.D. 330 held a synod attended by 270 bishops, and in A.D. 411 a conference was held at Carthage between 279 Donatists and 286 Catholic bishops. They afterwards gradually declined and became extinct on the conquest of the country by the Saracens. The existence of this sect gave rise to formidable wars and disturbances. Many of them were ambitious of martyrdom; others, along with the adherents among the lowest classes of the people, resisted the edicts issued against them. They adopted doctrines of civil equality, and from their habit of begging from door to door, acquired the name of *circumcelliones*.

DONATUS, ÆLIUS, a Roman grammarian and commentator who lived in the fourth century. He was the preceptor of St. Jerome. He made notes on five plays of Terence, which contain much interesting information, but have been greatly vitiated by subsequent interpolations. He wrote an elementary work on the Latin language (De octo Partibus Orationis), which served as a guide to the learning of Latin in the middle ages, and formed the groundwork of most elementary treatises until recent times. It was one of the books most frequently printed at the commencement of the art, several editions having

been issued from blocks even before the invention of types.

DONAU. See DANUBE.

DONAUESCHINGEN, a town, Baden, Lake circle, 29 miles east by south of Freiburg; pop. 3164. It contains the palace where the Prince of Fürstenberg usually resides, and in the garden of which a basin of clear sparkling water claims to be the true source of the Danube.

DONAUWÖRTH, a town, Bavaria, circle Swabia, at the confluence of the Wörnitz and Danube, both here crossed by bridges, 25 miles north by west of Augsburg; pop. 3559. It rises on a hill in the form of an amphitheatre, is walled and well built, and among other edifices contains the building of a fine old Benedictine abbey. Donauwörth fell to the house of Hohenstaufen in 1191, became the seat of the dukes of Upper Bavaria about the middle of the thirteenth century, and a free imperial city in 1308. It was seized by Duke Maximilian of Bavaria in 1607, and though it afterwards regained its privileges as a free city, it was finally handed over to Bavaria in 1714. The heights of Schellenberg in the vicinity are famous for the Bavarian entrenched camp, which was forced by Marlborough shortly before his victory at Blenheim.

DON BENITO, a town, Spain, Estremadura, province and 49 miles east of Badajoz, near the left bank of the Guadiana; pop. 14,610. It consists for the most part of substantial houses, and wide and tolerably well-paved streets, and has one fine square, with a promenade in its centre, a handsome town-hall and convent, manufactures of woollens, and a trade in cattle, grain, wool, oil, wine, and fruit.

DONCASTER, a market town, England, West Riding of Yorkshire, 142 miles north-west of London, and 25 miles south-east of Leeds, is pleasantly situated on the right bank of the Don, here crossed by two handsome stone bridges. Doncaster may be described generally as well built and handsome, the streets being for the most part straight, broad, and well paved. The parish church is a large and magnificent structure, built to replace the noble old church destroyed by fire in 1853. It has a tower 170 feet high, and cost over £50,000. Christ Church is a handsome modern fabric, built at a cost of £13,000. The other public buildings are the mansion-house, the town-hall, the theatre, jail, public library, news-room, corn exchange, covered market, lyceum, and the betting-room. The cross, a facsimile of an ancient one taken down in 1793, is a very elegant structure. The manufactures of Doncaster are inconsiderable, consisting chiefly of hemp and flax, canvas and sacking, some iron and brass foundries, rope-works, agricultural implement works, and extensive works belonging to the Great Northern Railway Co. It has a considerable trade in corn. The celebrated races of Doncaster, with which that name is now inseparably associated, commence on the Monday of the third week of September, and continue for five days. The race-course, nearly 2 miles in length, is about 1 mile from the town, on the road to London, and is one of the finest in the kingdom. The grand-stand is an elegant and commodious structure, erected by the corporation. A large sum has been spent by the corporation in forming and subsequently improving the race-course, since 1777, when the grand-stand was erected. The celebrated St. Leger stakes were established in 1776, and received their name from their principal founder, Colonel St. Leger, who resided in the neighbourhood of the town. In 1803 the King's plate of 100 guineas was removed from Burford to Doncaster. The races attract visitors from all parts of the kingdom, and even from foreign countries.

Doncaster was originally a Roman station, being at a point where one of the great Roman roads crossed the river Don, and is called *Danum* in the Itinerary of Antoninus. From the Saxons it obtained the name of *Dona Ceastre*, whence its present appellation. Previous to the Reformation it was the seat of several monastic establishments, amongst which were the White Friary, founded in 1350; the Gray Friary, founded in 1310; and the Black Friary, of uncertain date; with several chapels and hospitals. The Great Northern and Midland Railways have stations here. Pop. 18,768.

DONDRAH (or DONDERA) HEAD, the southern extremity of the island of Ceylon, is a steep, narrow, and rugged promontory overlooking a low tongue of land covered with cocoa-nut trees. It was the site of the Singhalese capital during part of the seventh century, numerous remains of which are still to be found. A single pillar on the sea-shore is supposed to mark the limit of Vishnu's empire, by whose followers the spot is held sacred. There is a temple here to this deity, and near the ruins of the capital there is a village with a Wesleyan school.

DONEGAL, a maritime county, Ireland, province of Ulster, bounded N. and W. by the Atlantic Ocean; E. by Lough Foyle, Londonderry, and Tyrone; and S.E. and S. by Fermanagh and Donegal Bay. Area, 1,193,443 acres, of which 393,191 are arable, and a large portion bog. The coast is indented with numerous bays; the most remarkable is Lough Swilly, which penetrates 25 miles inland. It is the most mountainous county in Ireland, but has many fine fertile valleys, and the scenery in the rougher districts is often magnificent. Some of the higher mountains attain an elevation of from about 2000 to nearly 2500 feet. Several small islands are scattered along the north-west coast, of which the North Arran Islands are the most considerable. The streams and lakes are numerous, but small. The climate is moist, the subsoil chiefly granite, mica-slate, and limestone, and the principal crops oats, potatoes, and flax, though wheat and barley are also successfully cultivated in some districts. The whole extent of land under crop in 1872 was 241,256 acres. Spade husbandry is much employed, and agriculture generally is in a very backward state, though improvement is going on in some quarters. The cattle are small and stunted, though improved of late years by the introduction of Scotch and English breeds; but the pasturage in general is unfitted for fattening, and is used only for grazing sheep, young cattle, and milk-cows. The manufactures are limited, and consist chiefly of linen cloth, woollen stockings, and worked muslin. There are several bleachfields in the county, and numerous flour-mills. The fisheries are extensive and valuable. Cod, ling, haddock, turbot, and other flat-fish, abound on the coast, but little is taken beyond supplies for the neighbourhood. There is a considerable sea-port trade. Whisky is made in large quantities, both licensed and unlicensed. The minerals of the county include marble of various and valuable kinds, lead and copper ores, iron pyrites, manganese, pipe-clay, &c., but none of these have yet been wrought to any advantage. Pearl-mussels abound in the rivers, in which large and fine pearls are often found. The only towns with above 2000 inhabitants are Ballyshannon and Letterkenny. Donegal contains six baronies, Banneagh, Boylagh, Innishowen, Kilmacrenan, Raphoe, and Tyrhugh; and fifty-one parishes; and returns two members to Parliament. Pop. in 1871, 217,992.

DONEGAL, a market-town of Ireland, in the preceding county, on the bay of the same name, at the mouth of the river Esk. Pop. 1502. The ruins of a monastery are in the vicinity.

DONETZ, or SEVERNOI DONETZ, a Russian river, which rises in government Kursk, flows almost due south, past the town of Tmiev, where it first becomes navigable; then E.S.E., forming the boundary of several governments, and, after a course of 400 miles, joins the right bank of the Don, doubling its volume. The country through which it flows is generally fertile, and its deep and majestic stream is well adapted for navigation.

DONGOLA (NEW), or MARAKAH (native, *El Urdy*—The Barracks), capital of the province of Dongola, Upper Nubia, about 600 feet from the left bank of the Nile, and sufficiently elevated to clear the inundation of the river; lat. 18° 52′ 12″ N.; lon. 30° 47′ 23″ E. It owes its origin to barracks built after plans by the naturalist Ehrenberg, in lieu of those destroyed at Old Dongola by the Mamelukes. It is the seat of a pasha, has government offices, a well-supplied bazaar, a coffee-house, indigo factory, and baths. It is the resting-place for the caravans from Kordofan and Senaar. Pop. 5000 or 6000.

DON GRATUIT.—1. A voluntary tax imposed on themselves by the French clergy on the demand of the king. Under the French monarchy this was the only lawful way in which the clergy could be taxed. 2. A similar tax imposed on themselves by the provinces. The origin of the *dons gratuits* has been traced to the presents which the Franks made annually to their princes. When the grants made by the clergy became annual (about 1516), they gave them this name, with the addition *et charitables*, to maintain their privileges, and avoid the appearance of admitting their liability to be taxed.

DONIZETTI, GAETANO, a celebrated composer, was born on Sept. 25, 1798, at Bergamo, in Italy, where his father occupied a humble position in life. He was destined for the legal profession, but having been placed, at the age of thirteen, in a musical institution in his native town, its director, John Simon Mayer, conceived so exalted an opinion of his pupil's talents for harmony, that he persuaded Donizetti's father to send him to Bologna to complete his musical studies under the distinguished Abbé Mattei. In this establishment, which Rossini had quitted some years previously, he remained for three years, and applied himself closely to the study of counterpoint and fugue. Through the encouragement of his old master he was induced to cultivate operatic music and composition; but a disagreement in consequence arose with his father, and in a fit of spleen he enlisted in the army when scarcely twenty years of age. He did not, however, abandon his musical pursuits; and his first opera, Enrico di Borgogna, was represented in 1818 at Venice, where his regiment was garrisoned. His first attempt was sufficiently successful to induce him to proceed in the same path, and Il Falegname di Livonia, Le Nozze in Villa, and Zoraïde di Granata, rapidly followed. The success of the last-mentioned opera procured for him the honour of being borne in triumph, and also enabled him to obtain his discharge from the army. He had now ascertained the proper sphere of his genius, and opera after opera was produced with the greatest facility from his prolific pen. The first work which established for him a European reputation was his Anna Bolena, represented at Milan in 1830, followed shortly afterwards by the charming Elisire d'Amore. Parisina, Torquato Tasso, and Lucrezia Borgia succeeded these; and in 1835 he paid his first visit to Paris, from which, however, he returned in the same year to Naples, where in six weeks he composed and presented on the stage his chef-d'œuvre Lucia di Lammermoor. The fame of this great creation spread rapidly over Europe, and it has long since established itself as one of the most popular pieces of the operatic *répertoire*. Shortly after the triumph thus achieved, Donizetti was appointed professor of counterpoint at the Royal College of Naples. In 1837 he sustained a severe bereavement by the death of his wife from cholera, followed by that of their two children, and the grief which he experienced on this occasion was so severe as seriously to alarm his friends. Another circumstance combined to render Naples distasteful to him. This was the interdiction by the dramatic censor of his opera of Poliuto, on the ground of religious propriety, and he in consequence resigned his appointment at the Royal Musical College, quitted Naples, and arrived in 1840 in Paris. He brought hither with him three new operas, La Fille du Régiment, Les Martyrs (an adaptation of the interdicted Poliuto), and La Favorite. None of these were at first successful, and the first had to be represented successfully on almost every stage in Europe before its merits came to be recognized by the Parisians. Justice was also accorded to the beauties of La Favorite in course of time. Of the subsequent operas of Donizetti none achieved any special triumph, except Linda di Chamouni, which was first produced at Vienna in 1842, and Don Pasquale in the following year at Paris. In 1844 the symptoms of a cerebral affection began to make their appearance on this gifted composer; the malady gradually gained strength, and in the commencement of 1846 he became an inmate of a lunatic asylum. He partially recovered towards the end of 1847, and set out to return to his native country. On the journey he had another attack of his ailment, which, after his arrival, renewed itself in the following spring. He died at Bergamo, on 8th April, 1848.

DONJON, in fortification, signifies a strong tower or redoubt, in old fortresses, whither the garrison could retreat in case of necessity.

DONKEY-ENGINE, a small engine used to feed the boiler of a larger one, or to assist in performing various operations where no great power is required. Thus a donkey-engine is often stationed on the deck of a ship to work a crane for loading and unloading the cargo.

DONNE, JOHN, D.D., a celebrated poet and divine, was the son of a merchant of London, in which city he was born in 1573. He studied both at Oxford and Cambridge, and was then entered at Lincoln's Inn. His parents were Catholics, but in his nineteenth year he abjured the Catholic religion, and became secretary to the Lord-chancellor Ellesmere. He continued in that capacity five years, but finally lost his office by a clandestine marriage with his patron's niece. The young couple were in consequence reduced to great distress. At length his father-in-law relented so far as to give his daughter a moderate portion; and they were lodged in the house of Sir Robert Drury, in London, whom Donne accompanied in his embassy to Paris. On his return he took orders by the desire of King James, and was soon after made one of his chaplains. He immediately received fourteen offers of benefices from persons of rank, but preferred settling in London, and was made preacher of Lincoln's Inn. In 1619 he accompanied the Earl of Doncaster in his embassy to the German princes. On his return he was appointed Dean of St. Paul's. He was chosen prolocutor to the convocation in 1623–24; and, in consequence of a dangerous illness, soon after wrote a religious work, entitled Devotions upon Emergent Occasions. He died in March, 1631, and was interred in St. Paul's. As a poet, and the precursor of Cowley, Donne may be deemed the founder of what Dr. Johnson calls the *metaphysical* class of poets; abounding in thought this school generally neglected versification, and that of Dr. Donne was

peculiarly harsh and unmusical. He wrote Latin verse with much elegance. A collection of his Latin poems was published in 1633. Of his prose works, one of the most remarkable is that entitled Biathanatos, to prove that suicide is not necessarily sinful, which he never published himself, but which found its way to the press after his death. His style is quaint and pedantic; but he displays sound learning, deep thinking, and originality of manner. Besides the works already mentioned, he wrote the Pseudo-Martyr (4to, 1610), Letters, Sermons, Essays on Divinity, and other pieces.

DONNYBROOK, a village, Ireland, in the county of and 2 miles south-east of Dublin, on the Dodder, here crossed by a handsome bridge; is famous for its fair, now abolished, which used to attract vast multitudes of persons, and seldom passed off without riot and bloodshed. It has a handsome parish church, a spacious Roman Catholic chapel, and several schools. Pop. 1892.

DONOVAN, EDWARD, a popular writer on natural history, died 1st February, 1837. He wrote a Natural History of British Insects, sixteen vols. 8vo (1792–1816). This work, though valuable at the time, has been surpassed by more recent treatises. Four volumes of a Natural History of British Birds were published from 1794 to 1797. Several works followed on the insects of China, of India, and of Asia, which contributed to diffuse a taste for entomology. Three volumes of a work entitled The Naturalist's Repository appeared in 1823 and the following years. These and numerous other publications yielded him a very small pecuniary return, and of this he complained in a publication a few years before his death.

DON QUIXOTE. See CERVANTES.

DOON, a river of Ayrshire which divides the districts of Kyle and Carrick. Its source is in Loch Enoch and other small lochs in the stewartry of Kirkcudbright, where it forms the Loch of Doon, a lake about 7 miles in length, and after a circuitous course of 16 miles falls into the sea about 2 miles south of Ayr. The Doon is the native river of Burns, and the beauty of its 'banks and braes' has received from him a not undeserved celebrity.

DORAK, a town, Persia, province Khuzistan, at the junction of a small river of the same name with the Jerahi, 300 miles S.E. Bagdad; lat. 30° 45′ N.; lon. 49° E. It stands upon a marshy plain, is composed of houses built with sun-dried bricks, and having sloping roofs; is defended by a fort and mud wall, and is surrounded by date plantations; and has a considerable commerce by a canal which connects the Dorak with the Karun. Pop. 6000.

DORAT, CLAUDE-JOSEPH, a French poet, born in 1734 at Paris; died 1780. He renounced the study of law, and afterwards the military service, into which he had entered as a musketeer, and devoted himself entirely to poetry. He wrote numerous dramas which were unsuccessful. He has succeeded better in songs, tales, and poetical epistles, but though he had great facility in composition, his works are not much esteemed. A brother poet apostrophizes him thus:—

> 'Non, rien ne vous manque vraiment,
> Rien que du gout et du génie.'

He had the vanity, however, to bring his poems out with the greatest elegance and sumptuousness, so that Grimm remarked of one of them, 'M. Dorat has just given us a work for spring, Les Baisers, précédé du mois de Mai, poëme, very spring-like, and adorned with so many vignettes and flowers, that it may be considered rather the work of Charles Eisen the engraver, than of Joseph Dorat the poet.' In this way he spent his patrimony, which was considerable, and left a heavy debt. Dorat's works appeared in Paris complete in twenty vols. (Œuvres choisies, 1786, three vols. 12mo).

DORCHESTER, the chief town in the county of Dorset, on an ascent above the river Frome, and on a branch of the London and South-western Railway, 118 miles S.W. from London. The agreeable and healthy situation of this place is almost proverbial. It has three spacious main streets, and is nearly encircled by a finely-planted avenue. Its principal edifices are three parish and several Dissenting churches, a handsome town-house and court-house, a grammar-school, jail, and house of correction. There are extensive cavalry barracks a little to the west of the town. Dorchester is famous for its ale. It was an important Roman station, was strongly fortified, and many interesting Roman remains are still to be found in the vicinity. Athelstane is said to have established a mint here about 925. It was occupied successively by the Royalists and Parliamentarians during the civil war. The assizes of Judge Jeffries were held here in 1685 on the occasion of Monmouth's rebellion. Dorset formerly returned two members to Parliament, but now returns one. Pop. in 1871, 6915.

DORDOGNE, a department of France, which includes the greater part of the ancient province of Périgord, and small portions of Limousin, Angoumois, and Saintonge. Its boundaries from N. to E. are Haute Vienne, Corrèze, and Lot; S., Lot et Garonne; W. to N., Gironde, Charente Inférieure, and Charente. Area, 3492 square miles. Pop. 502,673. Chief town, Périgueux. Its surface is so much broken by low ridges and precipices, that not more than one-third of the whole is fit for the plough, and the grain raised barely meets the consumption, but there are a considerable number of vineyards. The chief minerals are iron, which is abundant, slate, limestone, marble, and other stones. There are also traces of copper and lead. Mining is carried on to a considerable extent in the department. There are quarries of all kinds. Iron is supplied to the furnaces of Corrèze and several other surrounding departments, and is manufactured here both by coal and charcoal furnaces. A remarkable change in the variations of the temperature has been observed in this department within the last thirty years: the extremes of heat and cold, which formerly ranged from 79° to 24°, now extend from 81° to 14°, and even in extreme cases from 90° to 6°. It takes its name from its principal river, the Dordogne, which rises on the flanks of the Puy-de-Sancy, flows circuitously W.S.W., and after a course of 290 miles, of which 170 are navigable, unites with the Garonne, a little below Bourg, in forming the Gironde.

DORDRECHT (by contraction, *Dort*), a town, Holland, province South Holland, 14 miles S.W. Rotterdam, on the Maas, and on an island formed by the inundation of 1421. The town-house is an old but carefully preserved building. The famous Synod of Dort (1618–19) met in one of three *doelens*, or places of rendezvous for armed men, now used as a play-house. The Reformed have three churches, among which the Great or St. Mary's is a fabric of large size and great antiquity. Its vaulted stone roof covered, in Papal times, twenty chapels and forty altars. Its baptismal and communion vessels are of solid gold, and its pulpit is of white marble, and adorned with beautiful sculpture. There are also a Belgian Reformed, a Lutheran, an elegant new Roman Catholic church, a Jansenist church, and a synagogue. There are here a Literary Society, an Art Association, a seaman's college, a classical, an architectural, and other schools. Among the charities are an orphan-house, an infirmary, a lunatic asylum, and branch

associations of almost all the religious and benevolent societies in Holland. Dort is admirably situated for trade, being not only near the sea, but by the Rhine, the Maas, and other water communications, connected with an immense extent of inland territory. Hence an extensive trade in wood, coal, lime, seeds, grain, wine, oil, &c., and a large amount of ship-building. Its markets are well supplied with provisions. The neighbouring decoys furnish plenty of wild fowl; salmon, sturgeon, and other river fish, as well as a variety of sea-fish, are generally abundant.

The Reformation at first encountered great opposition in Dort. In 1566, when Reformed preachers generally commanded large audiences outside the gates of Dutch towns, they met here with no success. This tardy reception of evangelical doctrines was redeemed by subsequent zeal. During the disputes about the stadtholdership in 1672, the common people of Dort were violently attached to the house of Orange; but when those disputes revived in 1786, and the court of Prussia intervened, Dort assumed an attitude of defence, and obtained advantageous terms from the advancing Prussians. On the flight of the French public functionaries in 1813, its burghers showed great zeal in raising anew the national flag of Holland; and during a protracted interval, in which the French and Dutch ascendency alternated, courageously supported the cause of national independence. Pop. 24,651.

DORF, a very common syllable at the end of German names, signifying *village;* as *Altdorf*, *Dusseldorf*.

DORIA, one of the most powerful families of Genoa, became distinguished about the beginning of the twelfth century. It shared with the families Fieschi, Grimaldi, and Spinola the early government of the republic. These four were known as *Magnæ quatuor prosapiæ*, the four great families of this republic. The Dorias and the Spinolas belonged to the Ghibelline, the Fieschi and the Grimaldi to the Guelph faction; but as this division does not exhaust the combinations of which the number four is capable, the two distinct sections entertained their own private jealousies and quarrelled among themselves, Guelph with Guelph and Ghibelline with Ghibelline, making a delightful bear-garden of the dark and deep streets of their formidable city. The most distinguished member of the family was—

ANDREA, born at Oneglia in 1466 or 1468 (other authorities say at Carrascosa). He died at Genoa 25th November, 1560. He was left an orphan at an early age. The Dorias, to a younger branch of which his father belonged, were then in banishment, and his mother placed him under the protection of Domenico Doria, a relative of the elder branch. Domenico, who was then captain of the pope's guards, made his nephew enter his company. He afterwards passed first into the service of the Duke of Urbino and then into that of the Duke of Calabria, who commanded in Italy for the King of Arragon. He was rapidly promoted, and Alphonso II. gave him a command against Ludovico Sforza, duke of Milan. When the invasion of Charles VIII. drove the Spaniards from Naples he made a voyage to the Holy Land. On his return he attached himself to the French cause, which the victories of Gonsalvo had begun to imperil, and against this commander he defended Rocca-Guillelma with great distinction. When Charles VIII. had evacuated Italy he entered the service of Ludovico Sforza. In 1503 he entered Genoa, then in possession of the French, in order to accompany his uncle Domenico on an expedition against the pirates of Corsica. When the French had left Italy the Genoese intrusted the reconstruction of their fleet to Doria. He was first employed in suppressing the African pirates, from whom he captured a large booty, but was soon after exiled, and entered the service of Francis I., who named him admiral of the French galleys. His operations were attended with the most brilliant success, and after the battle of Pavia (1525) he followed the fleet which carried Francis prisoner to Spain, and would have attacked it but for the express command of the king. He then went into the service of the pope for about two years, returning to that of France in 1527, when he took Genoa for the French. Displeased with some demands of the French king, who in answer to his complaints deposed him from his command, he entered the service of Charles V. in 1528. His defection proved disastrous to the French cause in Italy. He occupied Genoa without resistance on 12th September, 1528, and his further successes contributed to the re-establishment of peace on 5th August, 1529. He re-established order in Genoa, and organized the government on a new basis, which became permanent during the independence of the republic. He refused the title of doge, because it would have compelled him to leave the imperial service. Charles bestowed on him the highest honours, and received in exchange the most important services. In 1532 he took Koron and Patras, in Greece, from the Turks, and in 1535 assisted in the capture of Tunis. He assisted next year in a descent on Provence, took Toulon, and ravaged the coasts of the Gulf of Lyons. The emperor and the King of France had afterwards an interview, which has become historical, on board his galley, with a view to the conclusion of peace. This interview took place at Aigues-Mortes in July, 1538. In 1539 he was sent against Barbarossa, and was suspected of having made a private arrangement with that commander to avoid a decisive engagement. In 1541 he took part in an unsuccessful expedition against Algiers. In 1547 he narrowly escaped assassination in a conspiracy raised in Genoa by the Fieschi. His nephew was killed in this conspiracy, which excited him to some severities approaching to the barbarity of earlier times. He died in 1560, without leaving any posterity. Doria has been accused, probably with justice, of selling his sword too freely, and to too many opposing interests; but his services to his country have earned him the titles of *father* and *liberator*, which were conferred on him, together with the censorship for life, by the Genoese senate in 1528.

DORIANS. The Dorians, one of the four great branches of the Greek nation, derive their name, according to legend, from Dorus, the son of Hellen. They dwelt first in Histiæotis, were then driven by the Perrhæbi into Macedonia, forced their way into Crete, where the lawgiver Minos, sprang from them, built the four Dorian towns (Dorica Tetrapolis) at the foot of Mount Œta, between Thessaly, Ætolia, Locris, and Phocis, and subsequently, together with the Heraclidæ, made a settlement in the Peloponnesus, where they ruled in Sparta. Colonies emigrated from them to Italy, Sicily, and Asia Minor. The four chief branches of the Greek race were distinguished from each other by marked peculiarities of dialect, manners, and government; and the Dorians were the reverse of the Ionians. The Doric manner always retained the antique style, and with it something solid and grave, but at the same time hard and rough. The Doric dialect was broad and rough; the Ionic, delicate and smooth; yet there was something venerable and dignified in the antique style of the former; for which reason it was often made use of in solemn odes, for example, in hymns and in choruses forming part of the religious service of the Greeks. The Cretan and Spar-

tan legislative codes of Minos and Lycurgus were much more rigid than the mild Athenian institutions of Solon. The Spartan women wore the light tucked-up hunting-dress, while the Ionian females arrayed themselves in long sweeping garments. Both have been idealized by artists: the one in Artemis and her nymphs, the other in Pallas Athene and the Canephoræ. The same contrast appears no less strikingly in their architecture, in the strong, unadorned Doric, and the slender, elegant Ionian columns. In the music of the ancients there was also a Dorian mode.

DORIGNY, the name of several celebrated painters and engravers.

1. MICHAEL, born at St. Quentin in 1617, a scholar of Simon Vouet, whose works he etched, and whose faults in drawing he copied. His style of execution is bold, and his management of light and shade good. He died while professor of the Academy at Paris, in 1665.

2. LOUIS, son of preceding, born in 1654, entered the School of Lebrun, and made a journey to Italy, where he copied the great masters. From Venice he went to Verona, where he settled, and died in 1742.

3. SIR NICHOLAS, the brother of the latter, born in 1658, at Paris, is the most celebrated engraver of the three here noticed. He spent twenty-eight years in Italy in studying the most illustrious masters, and eight in engraving the famous cartoons of Raphael, at Hampton Court, for which he received the honour of knighthood from King George I. In 1725 he became a member of the Academy at Paris, and died in 1746. One of his best engravings, besides his cartoons, is the Transfiguration, from Raphael, and the Apotheosis of St. Petronilla, after Guercino. His engraving is easy and strong, and the work of the needle and the graver happily united.

DORIS, the wife and sister of Nereus, by whom she became the mother of the Nereids. See NEREUS.

DORKING, a town in the county of Surrey, situated in a vale near the river Mole, which is nearly surrounded by hills, and on the road from London to Brighton, 22 miles s.s.w. of the former. The town consists of three wide and well-paved streets—the East, West, and South; and has many fine springs in the neighbourhood. Large quantities of fowls, of an excellent kind, and having five claws on the foot, are bred here, and sent to the London markets; they are supposed to have been originally brought over by the Romans. Dorking has a good town-hall, and a handsome cruciform church. Pop. in 1871, 5419.

DORMANT PARTNERS, in English law, in common language sometimes called *sleeping partners*, are partners who do not appear actively or take any share in the management of a business, but who share in its profits and are responsible for its liabilities. In strict legal parlance a sleeping or dormant partner is one whose name does not appear in the concern; but the name is commonly applied to a partner who has no share in the management of the business, even if his name is divulged.

DORMANT STATE or HIBERNATION of animals. We are all accustomed to see a large part of creation during summer in great activity, and in winter returning to an apparently inanimate state: we mean the plants; but this phenomenon is not common in the case of animals. There is, however, a small number of animals which, besides the daily rest that they have in common with most other animals, remain during some months in the year in an apparently lifeless state, and in utter inactivity. They are found not only in cold climates, but in very warm ones; for instance, the jerboa in Arabia, and the tanrec in Madagascar. The period of long sleep generally begins when the food of the animal begins to become scarce, and inactivity spreads over the vegetable kingdom. Instinct at this time impels the animals to seek a safe place for their period of rest. The bat hides itself in dark caves, or in walls of decayed buildings. The hedgehog envelops himself in leaves, and generally conceals himself in fern-brakes. Hamsters and marmots bury themselves in the ground, and the jumping-mouse of America incloses itself in a ball of clay. At the same time these singular animals roll themselves together in such a way that the extremities are protected against cold, and the abdominal intestines, and even the windpipe, are compressed, so that the circulation of the blood is checked. Many of them, especially the rodents, as the hamster and Norway rat, collect, previously to their period of sleep, considerable stores of food, on which they probably live until sleep overpowers them. In this period we observe in the animals, first a decrease of animal heat, which in the case of some is diminished 20°, with others 40° to 50° Fahr.; yet it is always higher than the temperature of the atmosphere in the winter months. If these animals are waked during winter they soon recover their natural warmth, and this artificial awaking does not injure them.

Secondly, animals in the dormant state breathe much slower and more interruptedly than at other times. Some will remain even a quarter of an hour without any respiration, and animals in this state seldom breathe more than once in a minute. Hence they corrupt the surrounding air much less than if their respiration was free. Of course the heart moves proportionally slow. With the hamster it only beats fifteen times a minute, whilst in a waking state it beats 115 times a minute. The irritability of the animals is very low; and hamsters in this state have been dissected, which only now and then gasped for air, or at least opened the mouth, and on which sulphuric acid, put on their intestines, had little or no effect. Marmots can be awakened only by powerful electric shocks. The digestion is also diminished; the stomach and intestines are usually empty; and, even if the animals are awakened, they do not manifest symptoms of appetite, except in heated rooms. The causes of the dormant state of animals have generally been sought in a peculiar construction of the organs. It is true that the veins in such animals are usually much wider and larger than in others; hence the arteries can exert comparatively little activity. The great *vena cava* also not merely opens into the right auricle of the heart, but divides itself into two considerable branches; and the thymus gland, which in the fœtus is so large, is also very extensive in this species of animals. The immediate cause, however, producing this torpidity is mostly, if not entirely, the cold. The animals of this species fall into this sleep in the middle of summer, if they are exposed to a cold temperature; on the other hand, they remain awake during winter if they are brought, towards autumn, into a warm room. Yet they fall asleep if the heating of the room is discontinued for some time. In the case of some of them confined air produces the sleep; thus a hamster may be made to sleep very easily if it is put into a vessel which is buried deep under ground. With frogs and other amphibious reptiles the dormant state is very common. As soon as the temperature of the atmosphere sinks under 50° Fahr., the number of pulsations of the heart is diminished from thirty to twelve in a minute. If, in this state, food is put into the stomach by force, it remains undigested for a long time. Frogs, serpents, and lizards, kept in artificial cold, may remain for years in this state; hence they have been sometimes found inclosed in stones, in which they have been perhaps for centuries. The other

lower animals, as snails, insects, &c., are also subject to a similar torpidity. A state of partial torpor takes place in the case of the common bear and the raccoon. The bear begins to be drowsy in November, when he is particularly fat, and retires into his den, which he has lined with moss, and where he but rarely awakes in winter. The badger also sleeps the greater part of the winter.

DORMER WINDOWS are windows inserted in the inclined plane of a sloping roof, on a frame vertical to the line of the rafters. In Gothic architecture they produce a pleasing effect.

DORMOUSE (*Myoxus*, Gm. Cuv.), a genus of mammiferous quadrupeds, of the order Rodentia. These little animals, which appear to be intermediate between the squirrels and the mice, inhabit temperate and warm countries, and subsist entirely on vegetable food. They have not the activity and sprightliness of the squirrel, but, like that animal, can ascend trees in search of their food, which they carefully store up for their winter consumption. This, however, is not great, as during the rigour of winter they retire to their retreats, and, rolling themselves up, fall into a torpid or lethargic state, which lasts, with little interruption, throughout that gloomy season.

> 'Tota mihi dormitur hyems, et pinguior illo
> Tempore sum, quo me nil nisi somnus alit.'
> Mart. lib. xiii. ep. 39.

Sometimes they experience a short revival in a warm, sunny day, when they take a little food, and then relapse into their former condition. During this torpidity their natural heat is considerably diminished. They make their nests of grass, moss, and dried leaves, about 6 inches in diameter, and open only from above. The number of young is generally three or four. Their pace is a kind of leap, in which, it is said, they are assisted by their tails. Like the jerboa, whilst feeding they sit upright, and carry the food to their mouth with their paws. When they are thirsty they do not lap, like most other quadrupeds, but dip their fore-feet, with the toes bent, into the water, and thus carry it to their mouths. They are distinguished from all the rest of the Rodentia by the want of the cœcum and large intestines. They were esteemed a great delicacy by the Romans, who had their *gliraria*, or places in which they were kept and fattened for the table.

DORNOCH, a small market town and parliamentary and royal burgh of Scotland, in the county of Sutherland, on the north-west coast of the Dornoch Firth, 29 miles north-east of Inverness. In the cathedral is the burying-place of the Sutherland family, containing a beautiful marble statue of a late duke. Dornoch was the seat of the extinct bishopric of Caithness; and Gilbert Murray, who was consecrated bishop in 1222, and is supposed to have built the cathedral, was canonized under the name of St. Gilbert. It was constituted a royal burgh by Charles I. in 1628, and is governed by a provost, magistrates, and council. Dornoch is one of the Wick district of parliamentary burghs. (See WICK.) Pop. 625.

DORNOCH FIRTH, an arm of the sea, on the east coast of the Highlands of Scotland, which partially divides Ross-shire from Sutherlandshire. It is about 10 miles broad at its mouth and 2 at the town of Dornoch. Above this point it becomes broader. On the south side it juts a little into Ross-shire, and this indentation is called the Bay of Tain. There are several ferries across the Firth.

DOROGOBOUJ, or DOROGOBUSH, a town of Russia, capital of district of same name, government of and 55 miles E.N.E. of Smolensk, on the Dnieper. It was partly burned by the French, who defeated the Russians here on 12th October, 1812. Pop. 7865.

DORPAT, or DOERPT (Russian, *Guriev*), a town, Russia, government Livonia, capital of circle of same name, at the foot of an eminence, on both sides of the greater Embach, here crossed by a stone bridge, about 135 miles N.E. Riga. The town is ranged in a semicircle; the houses are low, but well built. The public edifices, including the university buildings, are of hewn stone, and built in a grand and pure style. Dorpat is chiefly remarkable for its university, which was founded, in 1632, by Gustavus Adolphus, when the Swedes were masters; it was suppressed, in 1656, by the Muscovites; and re-established by the Emperor Alexander, in 1802–3. To this institution is attached an observatory, which the labours of Dr. Struve have made famous, and a library with over 80,000 volumes. The Professoren Institut, a kind of normal academy, founded in 1828, for training superior students aspiring to professorships, was formerly connected with the university. In the town are a gymnasium, or head school, with several academies for special branches of science and morals. Dorpat is an ancient town; and in the thirteenth century was a place of so much trading importance as to be admitted among the Hanse towns. In 1223 it was taken by the Teutonic knights from the Russians; and continued under the government of a bishop until reconquered by the Russians, under Ivan IV., in 1558. The Poles took it from the Russians in 1582, from whom again the Swedes took it in 1625. Peter the Great ultimately took it in 1704, and it has since remained in the possession of Russia. The vernacular language is Esthonian; but that of the learned is German. District law-courts are held here. Pop. 20,780.

D'ORSAY, ALFRED, COUNT. See BLESSINGTON (MARGARET).

DORSETSHIRE, a maritime county, England, bounded on the N. by Somersetshire and Wiltshire; E. by Hampshire; S. by the English Channel; and W. by Devonshire; area, 632,025 acres. The general surface of the county is undulating; its principal elevations being chalk downs, in some places wooded chiefly with hazel, of which the farmer makes hurdles, and the cottar fire-wood. The North Downs run through the northern portion of the county, the South Downs nearly parallel to the coast, meeting the former in the west, near Beaminster. The coast line is irregular, forming Poole harbour and Weymouth, or Melcombe Regis Bay, with the two promontories, St. Alban's Head and Portland Bill, the latter on the island, or rather peninsula, of same name. On the S., on the borders of Hampshire, and along part of the sea coast, is a heathy common, about 20 miles in length and 4 or 5 miles in breadth. The greater part of the county, however, is in grass, and is devoted either to the rearing of sheep or to the dairy system. The total acreage of all kinds under cultivation in 1872 was 467,809; of which 232,171 was under corn and other rotation crops, and 227,882 under permanent pasture. The total number of cattle in 1872 was 70,354, of which 46,513 were milk-cows; sheep, 491,650; agricultural horses, 14,307. The dairies are generally large, and the butter produced of good quality. The cheese is also good; and both sell well in the London market. Some excellent cider is made. Some flax and hemp are also cultivated on suitable soils. Agriculture has made considerable progress in recent years, though not so great as in some parts of England. The climate is mild, dry, and salubrious, but the harvests not remarkably early, though in the more sheltered parts vegetation is sufficiently forward. The principal rivers are the Stour, the Frome, and the Piddle, which have all a course N.W. to S.E., the latter two falling into Poole harbour. Neither

coal nor ores of any kind are found in this county; but its quarries yield the well-known Portland stone, so named from the island where it is chiefly developed, large quantities of which are exported. Pipe-clay, plastic clay, and potter's clay also abound; of the last a considerable quantity is sent to Staffordshire, for use in the finer sorts of earthenware. The principal manufactures are those of flax, canvas, ducks, &c., also silk and woollens. The fish frequenting the coast are of various kinds, but mackerel is the most abundant. Herrings and salmon are also caught. Near the mouth of Poole harbour is a prolific oyster bank. Dorset has nine lieutenancy subdivisions, and comprises thirty-four hundreds, twenty-two liberties, and the municipal boroughs of Blandford, Bridport, Dorchester, Lyme Regis, Poole, Shaftesbury, and Weymouth and Melcombe Regis. The county returns three members to Parliament, and six boroughs return seven. Pop. in 1871, 195,544.

DORT, or DORTRECHT. See DORDRECHT.

DORT, SYNOD OF, an assembly of Protestant divines convoked at Dort in 1618–19. Besides the Dutch and Walloon divines, it included representatives from England, Scotland, Switzerland, and part of Germany. It was chiefly occupied in considering the doctrines of Arminius (see ARMINIANS). It originated the project of translating the Bible into Dutch, which was executed after nineteen years' labour. The translation is known as the Dort Bible.

DORTMUND, a city of Prussia, province of Westphalia, situated on the Ems, 47 miles N.N.E. Cologne; pop. 44,454. It is surrounded by walls, but is poorly built. It has manufactures of cotton, linen, and woollen cloths, breweries, and a trade in corn and foreign produce. There are four fairs annually. It was once a free imperial and Hanseatic city. Its trade was almost ruined during the Thirty Years' war. In 1803 it was bestowed on the Prince of Orange; in 1808 Napoleon gave it to the Grand-duke of Berg; in 1815 it was ceded to Prussia. Its archives contain interesting manuscripts and documents of the time when the chief tribunal of the Vehme was here.

DORY, or JOHN DORY (*Zeus faber*), a fish belonging to the genus *Zeus* of Linnæus, and celebrated for the delicacy of its flesh. The species is distinguished by having the spinous portions of the dorsal and anal fins separated by a deep emargination from the soft-rayed portion, and having the base of all the vertical fins, and the carina of the belly anterior to the anal fin, furnished with spines or serratures; colour, yellowish-green, with a blackish spot on each side; dorsal and anal with furcate spines, and a long filament produced from behind each dorsal spinous ray. Tradition has rendered this fish famous on several accounts. First, it is said to derive the mark on each side of its body from the impression of the fore-finger and thumb of the apostle Peter. There is a schism among the superstitious in relation to this story, as the haddock also enjoys a similar distinction, it is affirmed, from the same cause. Another fable is, that the impression was produced by the foot of St. Christopher, which, it is fair to say, is equally probable. The dory obtains its food very much by stratagem, and its exceedingly protractile jaws enable it to capture small fish, &c., in its vicinity with ease, when lying concealed in the ooze or weeds. Torbay, in England, is distinguished as the locality from whence the greatest number of these fish is obtained. They are also found on the coasts of France, on the Atlantic shores of Europe, and in the Mediterranean. The name John Dory is supposed to be derived from the French *jaune doré*, golden yellow.

DOSITHEANS, an ancient sect among the Samaritans, so called from their founder Dositheus, who was a contemporary and associate of Simon Magus, and lived in the first century of the Christian era. They rejected the authority of the prophets, believed in the divine inspiration of their founder, and had many superstitious practices.

DOSSO DOSSI, a painter of Ferrara, much honoured by Duke Alfonso, and immortalized by Ariosto (whose portrait he executed in a masterly manner) in his Orlando, canto 23. His manner approaches to that of Titian, with whom he painted some apartments in the ducal castle. His paintings there represent bacchanalians, fauns, satyrs, and nymphs. In other paintings he imitated Raphael. Among eight of Dossi's pictures in Dresden, the Dispute of the Four Fathers of the Church is distinguished as a masterpiece by accurate delineation and peculiar power of colouring, and is entirely in the style of Titian. His brothers were less celebrated painters. He died 1560.

DOTIS, a market town, Hungary, county Komorn, capital district of same name, 37 miles W.N.W. Pesth. It consists of two parts, the one situated on a hill, and the other on a lake, and separated by the remains of a famous castle, once the residence of King Mathias Corvinus. It contains a castle, with a fine English garden; a Piarist college, with a gymnasium; a high school, and military hospital; and has warm baths, manufactures of woollens and stoneware, numerous mills, and an important fair. The chief curiosity of the place is its extensive cellarage, and the vast dimensions of some of the casks. There are some Roman antiquities in the neighbourhood. Pop. 4870.

DOTTEREL (*Charadrius morinellus*), a species of plover which breeds in the north of Europe, and returns to the south for the winter. Thus in Scotland it appears in April and leaves in August, the young being hatched in July. It is not known to breed in England, and is now rarer in Scotland than formerly, generally seeking more northern latitudes to breed. The bird is about 8 inches long. The summer plumage is as follows: in the male, the face is white, head blackish, nape and sides of neck ashy gray; a narrow brown band, succeeded by a broad white band, crosses the breast, the white being separated from a black spot on the abdomen by a bright ruddy area which extends to the sides; the wing margins are ruddy. The female has the abdominal black smaller and less distinct. The winter tints are more sombre, the ruddy tinge being lost. It is found all over Europe and Northern Asia. The dotterel has always been highly esteemed for the table, but its extermination in Britain is more likely to result from the assiduity of the egg collector than of the sportsman.

DOUAI (ancient *Duagium*), a town, France, department Norde, on the Scarpe, connected by canal with the Scheldt, and on the North of France Railway, 18 miles south of Lille. It is one of the oldest towns in France, was strongly fortified in the ninth century, and repeatedly taken and retaken, till finally secured to the French by the treaty of Utrecht. It is surrounded by old walls, flanked with round towers, the ramparts furnishing a beautiful promenade; and contains among its edifices and institutions a handsome parish church, a Gothic townhouse with a picturesque belfry, a celebrated Roman Catholic seminary, a library, and a museum. It has a cannon foundry, cotton and linen manufactories, tanneries, breweries, &c. The pop., 24,105, is small for the extent of the town, which seems not to be thriving.

DOUAI BIBLE. See BIBLE—English Translations of.

DOUARNENEZ, a sea-port, France, Finisterre, on a beautiful bay of the same name, 13 miles north-

east of Quimper; pop. 5434. It depends chiely on the sardine fishery, which employs 800 boats and 4000 men, and is advancing in population. The church of Plouaré is one of the finest specimens of ogival architecture in Brittany.

DOUBLE-BASS. See CONTRA-BASSO.

DOUBLE ENTENTE (French). *Mots à double entente* are words which have two different meanings; entente being, properly, the interpretation given to a word. *Double entendre* is often used for a phrase which has a covert as well as an obvious meaning.

DOUBLE FLAT AND DOUBLE SHARP indicate in music the lowering or raising a note a semitone which has already been raised or lowered a semitone above the natural key. In temperament a double flat or sharp is equal to raising or lowering a note a full tone.

DOUBLE-FLOWERING is the development by cultivation of the stamens and pistils of flowers into petals, by which the beauty of the flower is enhanced, and its reproductive powers sacrificed.

DOUBLE-INSURANCE (commercial law) is the effecting of two insurances upon the same goods. In marine insurance it is lawful for a shipper to insure his goods twice, but not for the purpose of recovering more than their value. The object of the second insurance is only to give an additional security in the event of the failure of the first underwriters. The insured in the event of a loss can claim it from either class of underwriters, but the loss is ultimately divided among the underwriters in the ratio of the risks they have taken, and those first claimed on can fall back on the others.

DOUBLING upon, in a naval engagement, the act of inclosing any part of a hostile fleet between two fires, or of cannonading it on both sides. It is usually performed by the van or rear of the fleet which is superior in number, taking the advantage of the wind, or of its situation and circumstances, and tacking or running round the van or rear of the enemy, who are thereby exposed to great danger.

DOUBLING A CAPE is to sail round or pass beyond it, so that the point of land shall separate the ship from her former situation, or lie between her and any distant observer.

DOUBLING THE CUBE was a celebrated problem among the ancient Greek geometers. According to legend the problem originated in an oracle of Apollo delivered to the people of Delos, and hence it has been called the Delian problem. The altar of Apollo at Delos was a cube, and once when they had offended him he ordered that the size of it should be doubled. This was easily done, but had no effect in mitigating the pestilence, which was the usual consequence of Apollo's wrath. On applying to him again the reply was that they must not alter the shape of the altar. Hence arose the problem to find the exact size of the side of a cube the content of which should be twice that of another given cube. The problem, however, was not invented by Apollo, he had only cunningly taken advantage of a problem which had already occupied Hippocrates of Chios and other Greek geometers. This problem the Greek geometers failed to solve, although their efforts to do so proved useful in advancing the study of geometry. It is indeed incapable of arithmetical solution, as will be made clear by merely examining the cubes of the first few numbers consecutively.

The cubes of the numbers from 1 to 9 are:

1	2	3	4	5	6	7	8	9
1	8	27	64	125	216	343	512	729

Here it is evident that taking any given arithmetical unit, it is impossible to find a number depending on it of which the cube will be double that of the cube of any other number depending on the same unit. If, for example, the side of Apollo's altar measured 3 feet, the cubic content of the doubled altar would have to be 54 feet; but it is clear that no whole number will give 54 as its cubic, and as no fraction multiplied by itself will give a whole number, the exact dimensions of the side of this doubled altar cannot be given either in whole feet or in any finite fraction of a foot. This does not prove, however, that a cube of this size cannot exist, but only that between its side and that of a cube whose side is 3 feet no definite arithmetical ratio can be established. The true nature of the problem was demonstrated by Descartes. It is expressed by the algebraical formula $x^3 = 2\,a^3$, x being the unknown and a the known quantity.

DOUBLOON, a Spanish coin: 1st, the gold doubloon of 320 reals was worth about 64*s.* to 66*s.* 6*d.* sterling; 2d, the doubloon de Plata Sencillo was equal to 60 reals-vellon, or 12*s.* 6*d.* sterling. There were at different epochs other doubloons of different values. See PISTOLE.

DOUBS, a department, France, bounded N. by Haute-Saône and Upper Alsace; E. and S.E., Switzerland; S.W. and W., Jura; N.W., Haute-Saône; area, 2028 square miles; chief town, Besançon. Its surface is generally mountainous, being traversed by four chains of the Jura, in directions parallel to each other, and to the main chain of the Alps. The principal summits are the Mont d'Or, 4920 feet, and Suchet, on the Swiss frontier, 5248 feet. The general inclination of the department is from east to west. It is drained chiefly by the river to which it owes its name, and which traverses it in a very remarkable manner; first from its source in a north-east, and afterwards, as if retracing its steps, in a south-west direction. The smaller streams are very numerous. Of perhaps still more importance than the river is the canal which connects the Rhone with the Rhine. The temperature is very variable, and the climate, determined in a great measure by the elevation of the surface, more rigorous than the latitude might seem to indicate. In the east of the department the snow lies till April or May. Only about one-third of the whole surface is arable, and nearly one-fifth is absolutely waste. The far greater part of the remainder is covered with forests of hardwood and pine. On the lower slopes walnuts and orchard fruits thrive well, and the vine is cultivated to some extent. The cereals produced fall considerably short of the home consumption. The other principal crops are maize, potatoes, hemp, flax, and medicinal plants. Both horses and horned cattle of good breeds are exported, and much dairy produce is employed in making Gruyère cheese. Rivers and lakes are well supplied with fish. The minerals include numerous rich mines of iron, which is worked and smelted to some extent in the department. Traces of argentiferous lead have been discovered. There is some coal, and a good deal of lignite. Gypsum and marble are abundant everywhere. The manufactures are in iron, cloths, and numerous minor articles. Doubs is divided into four arrondissements —Besançon, the capital; Baume-les-Dames, Montbelliard, and Pontarlier; subdivided into twenty-seven cantons and 639 communes. Pop. 298,072.

DOUGLAS, the largest town in the Isle of Man, is situated on the south-east coast, on the banks of two small streams. It is the only port in the island where goods imported by license are allowed to be landed. The approach by the sea is striking, the scenery of the bay being very picturesque. The older streets are narrow, but some of the newer are handsome and spacious. Among the public buildings may be mentioned the custom-house, once the residence of the Duke of Athol, the market-house, and

the theatre. Here is a pier 520 feet long, and from 40 to 50 broad, handsomely paved with freestone, and having a lighthouse at its extremity. The harbour is commodious. Douglas is a favourite watering-place. Pop. (1871), 13,972.

DOUGLAS, a family distinguished in the annals of Scotland. Their origin is unknown. They were already territorial magnates at the time when Bruce and Baliol were competitors for the crown, and like most of the Scottish nobility they did homage and took oaths of allegiance to Edward I. They had estates both in England and Scotland, but chiefly, and latterly exclusively, in Scotland. One of them, William Douglas, joined Wallace. As their estates lay on the borders, they early became guardians of the kingdom against the encroachments of the English, particularly of the Percies, who occupied a similar position on the English border, and acquired in this way power, habits, and experience which frequently made them formidable to the crown. We notice in chronological succession the most distinguished members of the family.

JAMES, son of the William Douglas who was Wallace's companion, commonly known as the Good Sir James, early joined Bruce, and was one of his chief supporters throughout his career, and one of the most distinguished leaders at the battle of Bannockburn. In 1319 Douglas and Randolph commanded a Scottish army which invaded England, and defeated an English army under the Archbishop of York, at Mitton, on 19th September. From the number of ecclesiastics among the dead this battle, with the dry humour which has always characterized the Scots, was called the 'chapter' of Mitton. Another invasion of England was made by the same leaders in 1327, which has been chronicled by Froissart. After the death of King Robert, Douglas, who had been commissioned to carry the heart of Bruce to Palestine in fulfilment of a vow he had made to go on the Crusade, set out on his pilgrimage, and fell fighting against the Moors in Spain, in 1331.

ARCHIBALD, youngest brother of Sir James, succeeded to the regency of Scotland in the infancy of David. He was defeated and killed at Halidon Hill by Edward III. in 1333, on which occasion, as historians say, the English recovered the prestige lost at the battle of Bannockburn.——WILLIAM, son of the preceding, was created first earl in 1357. He was taken prisoner with King David at the battle of Durham in 1346, but was soon after ransomed. He recovered Douglasdale from the English, and was frequently engaged in wars with them. He fought at the battle of Poitiers. He slew his relative the Knight of Liddisdale. He died 1384.——JAMES, the second earl, who, like his ancestors, was constantly engaged in border warfare, was killed at the battle of Otterburn in 1388.

SIR WILLIAM, lord of Nithsdale, was the illegitimate son of the third earl, and has received the epithet of the Black Douglas, which is sometimes also bestowed on the Good Sir James. After a successful career of warfare which made him the terror of the English, he went to the Continent, and so distinguished himself in the defence of Dantzig under the grand-master of the Teutonic order against the Pagan Prussians, that his arms with those of Scotland were placed over the great gate. He was killed there in 1390 in a conspiracy organized by Lord Clifford.

ARCHIBALD, the fourth earl, was the Douglas who was defeated and taken prisoner by Percy (Hotspur) at Homildon, 14th September, 1402, afterwards joined him in his rebellion against King Henry, and was taken prisoner at Shrewsbury, 23d July, 1403. It may be observed that Shakspeare has followed the inspiration of his own genius, and not the fact, in making Prince Henry deliver up Douglas after the battle without ransom. He did not recover his liberty till 1407. He acquired the surname of Tyneman from losing most of the battles in which he engaged. He was killed at the battle of Verneuil, in Normandy, in 1427. Charles VII. created him Duke of Touraine, which title descended to his successors.

WILLIAM, sixth earl, born 1422, together with his only brother David, was assassinated by Crichton and Livingstone at a banquet to which he had been invited in the name of the king, in Edinburgh Castle, on 24th November, 1440. Jealousy of the great power which the Douglases had acquired from their possessions in Scotland and France was the cause of this deed.

WILLIAM, the eighth earl, a descendant of the third earl, restored the power of the Douglases by a marriage with his cousin, heiress of another branch of the family, and by his politic behaviour acquired power over the king. He was appointed lord-lieutenant of the kingdom, and defeated the English at the battle of Sark. Latterly he entered into a treasonous league with the Earls of Crawford and Ross, and had committed several violent and unlawful acts when the king, James II., invited him to Stirling and murdered him with his own hand on 22d Feb. 1452.

JAMES, the ninth and last earl, brother of the preceding, immediately on his accession took up arms with his allies to avenge his death. His reluctance to attack the royal army when he was superior in force caused a general desertion of his allies, and he fled to England, where he continued an exile for nearly thirty years. He entered Scotland on a raid along with the banished Duke of Albany in 1484, when he was defeated and brought to the king, who caused him to be confined in the abbey of Lindores, in Fife, where he died in 1488.

His estates, which had been forfeited in 1455, were bestowed on the fourth Earl of Angus, the representative of a younger branch of the Douglas family, which continued long after to flourish. The fifth Earl of Angus, Archibald Douglas, was the celebrated 'Bell-the-Cat,' one of whose sons was Gavin Douglas the poet. He died in a monastery in 1514. Archibald, the sixth earl, married Queen Margaret, widow of James IV., attained the dignity of regent of the kingdom, and after various vicissitudes of fortune, having at one time been attainted and forced to flee from the kingdom, died about 1560. He left no son, and the title of Earl of Angus passed to his nephew David. James Douglas, brother of David, married the heiress of the Earl of Morton, which title he received on the death of his father-in-law. He afterwards obtained the regency of the kingdom. He was accused of participating in Darnley's death, and executed in 1581. His nephew, Archibald, eighth Earl of Angus, and Earl of Morton, died childless, and the earldom of Angus then passed to Sir William Douglas of Glenbervie, his cousin, whose son William was raised to the rank of Marquis of Douglas. Archibald, the great-grandson of William, was raised in 1703 to the dignity of Duke of Douglas, but died unmarried in 1761, when the ducal title became extinct, and the marquisate passed to the Duke of Hamilton, the descendant of a younger son of the first marquis.

DOUGLAS, DAVID, born at Scone in Perthshire, in 1798, was early placed as an apprentice in the garden of Scone Palace, and displayed a very decided turn for botany, spending his leisure in reading botanical works, and collecting the wild plants of the vicinity. In 1818 he removed to the garden of Valleyfield, in the parish of Culross, where a choice collection of exotics and a good botanical library fur-

nished him with the means of prosecuting his favourite study. His next situation was in the botanical garden at Glasgow, where he attracted the notice of Sir William Hooker, the professor of botany, who recommended him as a botanical collector to the Horticultural Society of London. He was accordingly, in 1823, sent by the society to the United States, where he procured many fine plants, and in particular increased the society's collection of fruit-trees. In 1824 he was sent on a second mission to explore the vegetation of the country adjoining the Columbia River, and southwards towards California. In making the voyage he never lost sight of his object, and was able, during the short time the vessel touched at Rio Janeiro, to collect many rare orchidaceous plants and bulbs. He arrived at Fort Vancouver in 1825, and sent home, from time to time, many beautiful plants, with seeds and dried specimens. A species of pine of gigantic size, one of several which he discovered, justly bears his name. In 1827 he crossed the Rocky Mountains to Hudson's Bay, and met Sir John Franklin, Richardson, and Back, returning from their second overland Arctic expedition, and returned with them to England. Shortly after he was admitted fellow of the Linnæan, Zoological, and Geological Societies. In 1829 he sailed again for the Columbia River, and afterwards went to the Sandwich Islands, where he met with a very tragical death, in 1834, at the early age of thirty-six. The natives are in the habit of digging pits to trap wild oxen. Douglas, on an excursion, accidentally fell into one of these pits, in which a bull had previously been caught, and when found was quite dead, and dreadfully mangled by the infuriated animal.

DOUGLAS, Gawin, an early Scottish poet of eminence. He was the son of Archibald, earl of Angus, and was born at Brechin about 1474. He received a liberal education, commenced at home and completed at the University of Paris. On returning to Scotland he took orders in the church, and was made provost of the church of St. Giles, at Edinburgh, afterwards abbot of Aberbrothock, and at length Bishop of Dunkeld. Political commotions after a time obliged him to seek a retreat in England, where he was liberally treated by Henry VIII. He died of the plague in London in 1522, and was interred in the Savoy church. Gawin Douglas translated the poem of Ovid, De Remedio Amoris; also, the Æneid of Virgil, and the supplementary book of Maphæus, in heroic verse. This work, in the Scottish language, is executed with great spirit; and considering the age, with extraordinary elegance of diction, far surpassing, in that respect, the succeeding productions of Phaer, Swine, and even of Lord Surrey. It was written about 1512, and is said to have been completed in sixteen months. To each book is prefixed a highly poetical prologue. It was first published in 1553 (London, 4to), and reprinted at Edinburgh (1710, folio). He also wrote The Palace of Honour and King Hart, both metaphorical poems. The former was published in 1553.

DOUGLAS, Sir Howard, Baronet, K.C.B., a British general, was born at Gosport, Hampshire, in 1776. He was the son of Admiral Sir Charles Douglas, a distinguished naval officer. He entered the army at an early age, and served in Sir John Moore's Peninsular campaign ending with the battle of Coruña, 16th January, 1809, and afterwards took part in the Walcheren expedition. He returned to England the same year, on the death of his brother, when he succeeded to the title. He served in Spain again in 1811–12. In 1816 he published an Essay on Military Bridges, and in 1819 a Treatise on Naval Gunnery, the MS. of which he had sent to the admiralty in 1817, and which he dedicated by special permission to the lords commissioners. From 1823 to 1829 he was governor of New Brunswick; from 1835 to 1840 Lord High-commissioner of the Ionian Islands. He was member of Parliament for Liverpool from 1842–47. He attained the rank of general in 1851, and died at Tunbridge Wells in November, 1861. Besides the works mentioned he published in 1832 a work on Naval Tactics, in which he claimed for his father the honour of the tactics by which Rodney's victory in 1782 was achieved.

DOUGLAS, John, D.D., a divine and critic, was born in Scotland in 1721. After some education at a grammar-school in his native country he was sent to the University of Oxford in 1736, and in 1743 he took the degree of M.A. Soon after he was appointed chaplain to the 3d Regiment of Foot-guards. He was afterwards tutor to Lord Pulteney, with whom he visited several parts of the Continent, but quitted him and returned to England in 1749, when his patron, the Earl of Bath, presented him with several benefices. His first literary production was a letter to the Earl of Bath, entitled Milton vindicated from the Charge of Plagiarism, brought against him by Mr. Lauder (1751, 8vo). In 1754 he published a tract, entitled The Criterion, or a Discourse on Miracles. In 1762 he was made Canon of Windsor, which benefice he exchanged with Dr. Barrington for a residentiary canonry of St. Paul's. In 1777 he was employed in preparing for the press the journal of Captain Cook's second voyage, to which he prefixed a well written introduction, and added notes. He assisted Lord Hardwicke in arranging and publishing his Miscellaneous Papers, which appeared the following year. In 1778 he was elected a fellow of the Royal and Antiquarian Societies; and in 1781 he edited the account of Captain Cook's third voyage. In 1787 he was raised to the see of Carlisle, and in 1792 was made Bishop of Salisbury. He died May 18, 1807.

DOUNE, a market town, Scotland, Perthshire, near the left bank of the Teith, 7 miles north-west of Stirling. It is famous for its cattle fairs, and its ancient castle, still a large and imposing ruin, which was occupied frequently by Margaret, widow of James IV., and occasionally by Queen Mary. The large cotton-mills of Deanston are in the vicinity. Pop. in 1871, 1262.

DOURO, or Duero, one of the largest rivers of the Spanish Peninsula, which, flowing west, traverses about one-half of Spain and the whole of Portugal, and, after a course of 500 miles, falls into the Atlantic 3 miles below Oporto. It flows through a fertile and picturesque country, having its banks and adjoining slopes lined with vineyards, in which much of the well-known port wine is produced. It is not of much navigable importance, but small vessels ascend about 70 miles from its mouth. It gives its name to the province of Douro, which has an area of 2916 geographical square miles, and 903,874 inhabitants.

DOUSA, Jan, or Van der Does, a Dutch statesman, philologist, historian, and poet, was born in 1545, at Noordwyk, in Holland. He studied at Delft and Louvain, resided some time at Paris, and then lived in domestic retirement, devoted to literary pursuits, till 1572, when he went ambassador to England to obtain the support of Queen Elizabeth for the cause of the Dutch. As chief commander, during the siege of Leyden by the Spaniards, he conducted himself with prudence and courage in the midst of the horrors of famine, plague, and civil dissensions. He kept up an intercourse with the expected deliverers by means of trained pigeons; and to these faithful messengers he has expressed his gratitude in some of his poems. The stadtholder, William I., compensated the city for its sufferings by the estab-

lishment of the university, of which Dousa was the first curator. His extensive connections with the literary men of other countries enabled him to procure for the new institution that most distinguished instructor, Joseph Scaliger. After the assassination of William I. Dousa secretly visited London to seek the protection of Queen Elizabeth for the freedom of his country, of which he was always the faithful defender; and during the period when the government of the Earl of Leicester proved oppressive to the Dutch (see DUDLEY, ROBERT) he conducted himself with prudence and moderation. Domestic misfortunes, particularly the death of his eldest son, Janus Dousa, a youth of great promise, afflicted the last years of his life. He died in 1604. The many works which he left show how true he was to his motto—*Dulces ante omnia Musæ*. His best known work is Bataviæ Hollandiæque Annales (1599), which had been commenced by his son. It was published both in verse and in prose.

DOUW, GERARD. See DOW (GERARD).

DOVE. See TURTLE DOVE and PIGEON.

DOVE, a river, England, rising in the hills of the Peak of Derbyshire, forms part of the boundary between Derby and Stafford, and, after a southerly course of 39 miles through highly picturesque scenery, falls into the Trent below Burton.

DOVER (Latin, *Dubris;* Saxon, *Doffa* or *Doffra*), a town of England, county Kent, 67 miles south-east of London. It lies on the coast of the Strait of Dover, and is one of the Cinque Ports. The London, Chatham, and Dover, and the South-eastern Railway terminate here. Dover is 21 miles distant from Calais, on the French coast. It lies in a deep valley formed by a depression of the chalk cliffs which abut on the sea on either side of the town, and is irregularly built. The Marine Parade contains elegant houses for sea-bathing visitors, of whom a considerable number frequent the town during the season. The hotels are elegant and commodious, and there are a theatre, assembly-rooms, reading-rooms, baths, &c. Ship-building and sail and rope making are carried on; but the chief dependence of the town is on summer visitors, and on the passenger traffic to and from Calais and Ostend, with which there is regular communication by steamer. Dover harbour has been much improved in recent years at a heavy expense, and ships of the largest tonnage will soon be able to enter and leave with ease. There are three basins. The entrance is protected by the Admiralty Pier, which is more than 1700 feet in length, and has cost about £700,000. The celebrated castle of Dover stands on a chalk cliff about 350 feet in height, about 1½ mile north-east of the town; the old and new buildings together occupy nearly 30 acres, and consist of a heterogeneous assemblage of fortifications of all styles and ages—Roman, Saxon, Norman, and modern; presenting, it is said, some of the earliest specimens of regular masonry in this country, and the entire appearance being striking and picturesque. The lord warden of the Cinque Ports is constable. Shakspeare's Cliff is situated at a little distance from the town, and is perforated by a tunnel on the South-eastern Railway. In May, 1847, a huge mass of this chalk cliff scaled off, and fell to the base; the mass was 254 feet in height, 15 feet thick, and was calculated to contain 48,000 tons of chalk. Shortly after, another fall of 10,000 cubic yards took place. The cliff is 350 feet high, and though sufficiently remarkable in form, does not bear out the magnificent description of the poet.

Dover is the principal station and seat of government of the Cinque Ports, and has returned two members of Parliament since the time of Edward I. Pop. of mun. and parl. bor. in 1871, 28,506.

DOVER, a city of the United States of America, in New Hampshire, the capital of Strafford county. It is situated on the west side of the Piscataqua, and the Cochecho flows through it. This river has several falls, the largest of which, upwards of 40 feet perpendicular, are at the centre of the town, and afford water-power equal to any in New England. Large iron and cotton manufactories have been erected on these falls, and others 2 miles higher up the river. The greatest part of the timber exported from the state is brought to this town. Dover is the oldest town in New Hampshire, having been settled in 1623, by Edward and William Hilton. Pop. in 1870, 9294.

DOVER, a post-town of Delaware, Kent county, the seat of the government of the state. It carries on a considerable trade with Philadelphia in flour. Pop. 6394.

DOVER, STRAITS OF, the narrow channel between Dover and Calais, which separates Great Britain from the French coast. Britain is supposed by many to have been once a peninsula, the present straits occupying the site of the isthmus which joined it to Gaul. 'The correspondency of strata,' says Mr. Pennant in his Arct. Zoology, 'on part of the opposite shores of Britain and France leaves no room to doubt that they were once united. The chalky cliffs of Blancnez, between Calais and Boulogne, and those to the westward of Dover, exactly tally: the last are vast and continued, the former short, and the termination of the immense bed. Between Boulogne and Folkstone (about 6 miles from the latter) is another memorial of the junction of the two countries—a narrow submarine hill, called the *Rip-raps*, about ¼ mile broad and 10 miles long, extending eastward towards the Goodwin Sands. Its materials are boulder-stones, derived from many strata. The depth of water on it, in very low spring-tides, is only 14 feet. The fishermen from Folkstone have often touched it with a 15-feet oar; so that it is justly the dread of navigators. Many a tall ship has struck on it, and sunk instantly into 21 fathoms of water.' In July, 1782, the *Belleisle*, of sixty-four tons, struck and lay on it during three hours; but by starting her beer and water, got clear off. These celebrated straits are only 21 miles wide in the narrowest part; from the pier at Dover to that of Calais 24 miles. It is said that their breadth is diminishing, and that they are 2 miles narrower than they were in ancient times. An accurate observer for fifty years remarks that the increased height of water, from a decrease of breadth, has been apparent even in that space. The depth of the channel, at a medium, in the highest spring-tides, is about 25 fathoms; the bottom is either coarse sand or rugged scars, which have, for ages unknown, resisted the attrition of the currents.

DOVER'S POWDER, a preparation frequently used in medical practice to produce perspiration. It consists of 1 grain of opium, 1 of ipecacuanha, and 8 of sulphate of potash in every 10 grains, which constitute a full dose. In preparing it the ingredients must be thoroughly mixed.

DOVETAILING, in carpentry, is the fastening boards together by letting one piece into another, in the form of the tail of a dove. The dovetail is the strongest of jointings, because the tenon, or piece of wood which is put into the other, goes widening to the end, so that it cannot be drawn out again.

DOVRE-FIELD, or DOFRINES, an assemblage of mountain masses, Norway, forming the central part of the Scandinavian system, and extending E.N.E. from lat. 62° N., where the Langfield terminates, to lat. 63°, where the Koelen begins. It is generally composed of gneiss and mica schist. Its snowy summit, Sneehaettan, 8120 feet, is the culminating point of Scandinavia.

DOW, or Douw (properly Dou), Gerard, an eminent painter of the Dutch school, was the son of a glazier, and born at Leyden in 1613. He studied under Rembrandt, and was distinguished for the excellence of his colouring and *chiaroscuro*. He surpassed his master in diligence, and nothing can be more finished than his small pieces. They are so delicate that a magnifying-glass is necessary to see distinctly the work in them. His softest figures are full of life, and he never neglected, in his representations, the almost invisible minutiæ of nature. Still his paintings do not appear artificial nor forced. He is regarded as the inventor of the ingenious mode of painting large pictures on a reduced scale, by covering the original with a frame, including a space divided into small quadrangular parts by means of threads, and then transferring the parts into an equal number of similar divisions, drawn on the canvas. He made use of the convex mirror to represent objects on a reduced scale. Dow died in February, 1675, leaving a large property. His works brought high prices, and are still among the dearest of the Dutch school. In 1809 a picture painted by him for the Royal Museum of Holland was sold for 17,000 gilders; and at the auction of Peter de Smith in Amsterdam, in 1810, Dow's pictures brought from 5000 to 10,000 gilders.

DOWER, in English law, is the right which a wife (not being an alien) has in the lands and tenements of which her husband dies possessed. By common law this right amounts to one-third of his estate during her life; by local custom it is frequently greater. Where the custom of *gavel-kind* prevails the widow's share is a half, and that of *free-bench* gives her the whole of a copyhold. The law of dower has been found to cause many inconveniences, and many devices have been resorted to in order to evade it. By the statute of Henry VIII. cap. x. a jointure was provided in lieu of dower, and it was enacted that no widow could claim both dower and jointure. This law was also found inconvenient, and various artificial forms of conveyance were adopted in bar of dower. By the Dower Act, 3 and 4 William IV. cap. cv., women married after January 1, 1834, cannot claim dower out of land disposed of by their husbands in their lifetime, or by their will, and encumbrances created by the husband are good against dower.

DOWLAS, a kind of coarse linen formerly much used by working people for shirts; this use of it is now generally superseded by calico. Derby dowlas is a calico made in imitation of dowlas.

DOWLETABAD, or Daulatabad, one of the most remarkable fortresses of India, province and 10 miles north-west of Aurangabad. It occupies an isolated rock 300, or according to some accounts, 500 feet high, and forming, for about a third of its height, a mural precipice. The only access to the summit, the view from which is magnificent, is through a low excavation in the heart of the rock. A large tank, hewn out of the rock, supplies it with water. It belongs to the Nizam of Haidarabad.

DOWN, a county of Ireland, in the province of Ulster, bounded N. by the county of Antrim and Belfast Lough, E. and S. by the Irish Sea, and W. by the county of Armagh. It is 50 miles in extreme length by 38 in breadth; area 612,495 acres, of which 514,180 are arable. Down is copiously watered by a spacious inlet from the sea on the east, by numerous small lakes, and by the rivers Bann, Lurgan, and Newry. A navigable canal connects the Bann and Newry, which opens a communication with Lough Neagh for vessels of 50 or 60 tons burden. There are many chalybeate springs in this county, and several impregnated with other minerals. The surface is very irregular, and a considerable part mountainous. Slieve Donard, the second mountain in Ireland, rises here 2809 feet above the level of the sea. This county contains copper, lead, black marble, susceptible of a high polish, coal, slate, freestone, limestone. There are extensive freestone, slate, and limestone quarries, and crystals. Marine exuviæ are also found in the hills at a great distance from the sea. Plantations are scarce, but natural woods are seen in several places, and orchards are common, a small one being attached to almost every cottage in the bleaching districts of the low grounds. Agriculture is comparatively advanced; draining and irrigation are practised extensively; oats, wheat and barley, potatoes, turnips, mangel-wurzel, and flax, are cultivated. The native breed of sheep is prized for the delicacy of the mutton, and some of the wool is of a very fine texture. In 1872, 332,970 acres were under crops of all sorts, of which wheat covered 34,056; oats, 122,334; potatoes, 59,648; flax, 20,455. The number of cattle was 141,688; sheep, 71,866; pigs, 51,648. The principal manufactures are linen and muslin, various in quality, and in great quantity. Cotton and woollen manufactures have also made some progress, and stocking-weaving is carried on extensively. Bleaching is conducted on a large scale on the banks of the rivers. Paper is made at Lambeg, and hammered iron at Newry. The fisheries on the coast are considerable: cod, haddocks and herrings are found in quantity, and oysters are cultivated. The Presbyterian form of worship predominates in this county, especially in the towns, of which the principal are Downpatrick, Newtonards, and Banbridge, together with Newry, part of which is in Armagh county. The county returns two members to Parliament, and Downpatrick and Newry one member each. Pop. in 1871, 277,775.

DOWN, or Downpatrick, a borough town in the above county, is beautifully situated in a valley nearly surrounded by hills, at a distance of 74 miles N.E. of Dublin, and 21 S.E. of Belfast. It has a small hospital, a cathedral, court-house, infirmary, and fever hospital. The trade is chiefly in linen and agricultural produce. Downpatrick is celebrated as the supposed place of St. Patrick's interment. A well in the vicinity, dedicated to that saint, is held in high veneration. Pop. 4154.

DOWNS, banks or elevations of sand which the sea gathers and forms along its shores, and which serve it as a barrier. The term is also applied to large tracts of naked, poor land, on which sheep usually graze.

DOWNS, The, a celebrated road for ships, extending 6 miles along the east coast of Kent, in England, between North and South Foreland, where both the outward and homeward bound ships frequently make some stay, and squadrons of men-of-war rendezvous in time of war. It affords excellent anchorage, and is defended by the castles of Deal, Dover, and Sandwich, as well as by Goodwin Sands.

DOXOLOGY (from Greek *doxa*, praise, glory, and *logos*). This name is given to hymns in praise of the Almighty, distinguished by the title of *greater* and *lesser*. Both the doxologies have a place in the Church of England, the latter being repeated after every psalm, and the former used in the communion service. Doxology the greater, or the angelic hymn, was of great note in the ancient church. It began with the words which the angels sang at our Saviour's birth, 'Glory be to God on high,' &c. It was chiefly used in the communion service and in private devotions. Doxology the lesser was anciently only a single sentence, without response, in these words —'Glory be to the Father, and to the Son, and to the Holy Ghost, world without end; amen.' Part

of the latter clause, 'as it was in the beginning, is now, and ever shall be,' was inserted some time after the first composition. Some read this ancient hymn, 'Glory be to the Father, and to the Son, with the Holy Ghost;' others, 'Glory be to the Father, in or by the Son, and by the Holy Ghost.' This difference of expression occasioned no disputes in the church till the followers of Arius began to make use of the latter as a distinguishing characteristic of their party, when it was entirely laid aside by the Catholics, and the use of it was sufficient to bring any one under suspicion of heterodoxy. The doxology was used at the close of every solemn office. The Western Church repeated it at the end of every psalm. Many of the prayers were also concluded with it, particularly the solemn thanksgiving or consecration prayer, at the celebration of the eucharist. It was also the ordinary conclusion of the sermons.

DOYEN, Gabriel François, a French painter, was born at Paris in 1726, and became a pupil of the painter Vanloo. At the age of twenty he gained the first prize for painting. He went to Rome in 1748, where the works of those painters who were distinguished for boldness of design and strength of expression, as Annibal Carracci, Pietro di Cortona, Giulio Romano, Polidore, and Michael Angelo, were the particular objects of his study and enthusiastic emulation. After his return to Paris he remained a long time without employment, occupied solely with his art. He spent two years in the execution of his Virginia, which procured him admission into the Academy of Painting in 1758. The picture La Peste des Ardents, for the church of St. Roch, increased his reputation. To give his works more truth he visited the hospitals, and studied the expression and appearances of the sick and dying. He executed several works for the court. In the beginning of the revolution Catharine II. invited him to Russia, gave him a pension of 1200 rubles, with a residence in one of the palaces, and appointed him professor in the Academy of Painting at St. Petersburg. After the death of the empress Paul II. continued to treat him with equal favour. He painted much for the imperial palaces, and died at St. Petersburg June 5, 1806.

DRACHENFELS, 'the castled crag of Drachenfels,' as Byron calls it, one of the hills known as the Siebengebirge, in the government of Cologne, in Rhenish Prussia, about 8 miles south-east of Bonn. It is the most remarkable of the group, which are all evidently volcanic; rises about 900 feet above the Rhine, whose famous scenery has here its commencement, and is crowned by the old castle of Drachenfels, commanding a magnificent view. It takes its name from the legend of a dragon which occupied a cavern in it, and was slain by Siegfried, the hero of the Niebelungen.

DRACHMA (*drachmē*), the unit of weight and of money among the ancient Greeks, both as a weight and a coin contained six oboli, and was itself the 100th part of a mina, and the 6000th part of a talent. According to the calculations of Wurm the weight of the Attic drachma is 67·383 grains English Troy weight, and the Attic talent 70 lbs. 6½ oz. The calculation of M. Letronne differs slightly from this. There were several other kinds of drachma and talent in use: those of Ægina were the heaviest, the Æginetic talent being equal to 10,000 Attic drachmas; the Euboic talent was nearly the same as the Attic; the Rhodian and Egyptian talents were each about one-third of the Attic. Whenever no particular kind is designated, the Attic talent is meant. The drachma was the principal Greek coin. It was of silver, and was divided, like the weight, into six oboli (silver). The tetradrachma (of four drachmas) was called the *stater*. These coins differed much in value in the different states of Greece and at different periods. The Attic drachma and stater occur most frequently. Those coined previous to the time of Pericles were worth about 8½*d.*, the talents (silver), of course, £230; the value of the later drachmas (during the two centuries before and after the Christian era) was 7½*d.*; of the talents, £205. The stater, in the former period, was worth 2*s.* 10*d.*; in the latter, 2*s.* 6*d.* Besides these silver coins there were also the stater of gold, equal in value to twenty drachmas; and the talent of gold, which was used sometimes to designate a quantity of gold equal in *value*, sometimes a quantity of gold equal in *weight*, to the silver talent. It sometimes also designates a gold coin weighing six drachmas. In the time of Solon a sheep could be bought for one drachma, an ox for five. In the time of Demosthenes a fat ox cost eighty drachmas, a lamb ten.

DRACO, an archon and legislator of Athens, about 620 B.C., celebrated for the extraordinary severity of his laws. The slightest offence, such as stealing fruit, and even idleness, he punished with death, no less than sacrilege, murder, or treason. Hence his laws were said to be written in blood. Nothing was more natural than that this rigour should render them odious and prevent their execution, especially as the people became more civilized and refined. Solon was therefore commissioned to compose a new code. (See Attica.) Tradition relates that Draco, on his appearance in the theatre at Ægina, where he is said to have carried his laws, was suffocated amidst the applauses of the people, who, according to their custom, threw their garments and caps upon him. He was buried under the theatre.

DRAFT, or Draught.—1. A bill drawn by one person on another. (See Bill of Exchange.) 2. A rough copy of any document intended to be afterwards transcribed.

DRAGGING THE ANCHOR, the act of trailing it along the bottom, after it is loosened from the ground, by the effort of the wind or current.

DRAG-NET, a net drawn along the bottom of a river or pond to catch fish. The use of drag-nets is usually prohibited in rivers where fish breed, as it takes all indiscriminately.

DRAGOMAN (Italian, *dragomano*, from the Arabic *terjuman*), the general name for an interpreter among Europeans throughout the East, and especially in the Levant countries. The dragoman of the Porte, through whom diplomatic negotiations with foreign powers were carried on, used formerly to be a very important dignitary, but is now of much less account. The various consulates and embassies in the Levant have dragomans officially attached to them.

DRAGON, in astronomy, one of the northern constellations. Fable says that Juno translated to the heavens the dragon which kept the golden apples in the garden of the Hesperides, and which was slain by Hercules.

DRAGON, a fabulous monster, the stories regarding which reach back almost as far as history. His form is described as most terrible, and his residence has been assigned to almost all countries, particularly that part of India and Africa that was formerly unknown. His length is represented from 20 to 70 ells. Of the latter sort was the dragon which lived in India, according to Ælian, in the time of Alexander the Great, and was venerated as a god. The dragon is described as having no feet, but as crawling like a serpent, his body covered with scales, and his neck, according to some accounts, adorned with a mane. These relations are almost all contradictory, and agree only in this—that the dragon had very acute senses, especially a piercing vision. His strength was so

great that he could easily strangle an elephant. His food consisted of the blood and flesh of all sorts of animals and of various fruits. Notwithstanding his ferocity, however, the dragon might be confined and tamed, which the old authors represent as having happened in various cases. The dragon of the middle ages had four lion's feet, a long, thick, serpent's tail, and an immense throat, from which streamed flames of fire. This dragon played a distinguished part in the ages of chivalry: he is one of those monsters whom it was the business of the heroes of romance to destroy. The idea of the dragon of the middle ages probably grew out of indistinct and exaggerated accounts of the crocodiles of the Nile, which were brought to Europe by means of the Crusades, and from similar descriptions of the largest land serpents. Even at the present day, the existence of dragons is fully believed in by the inhabitants of certain countries.

DRAGON, or DRAGON-LIZARD. Several species of dragon-lizards are described by naturalists, inhabiting Asia, Africa, and South America. The characters of the common flying lizard (*Draco volans*) are the following:—Length, seldom exceeding 12 inches; body lacertiform; sides furnished with peculiar productions of the skin, supported by internal cartilaginous rays or false ribs, which, when expanded, enable it to support itself in the air for a few seconds in springing from branch to branch among the lofty trees in which it resides; body and wings covered with small scales; back slightly carinate; throat with the skin produced into a pouch-shaped expansion, which is inflated with air at the pleasure of the animal. They move about actively among the branches, and unless when darting to some distance their wings remain folded on their sides. The food consists almost exclusively of insects. Colour varied with blackish, brown, and whitish. Dried specimens, preserved in the cabinets of the curious, do not give a good idea of the animal, as the process of drying destroys the proportions.

DRAGON-FLY. The family of neuropterous insects to which the dragon-fly belongs, Libellulina, has no exact analogue in any other division of the animal kingdom. The tiger possesses elegance of form and ornament, along with ferocity; the hawk is graceful; the shark is nimble and voracious; but the dragon-fly combines beauty of form and colour, and grace of movement, such as merits the French name *Demoiselle*, with a ferocity which gratifies itself by destruction for destruction's sake, after its wants have been supplied. The head is large and freely movable; the eyes large, lateral, or when the head is hemispherical, as in *Libellula*, the eyes meet in the middle line. Ocelli are either in a row or form a triangle. The large upper lip overhangs the mouth; the maxillæ are horny, denticulate, and powerful. The thorax is peculiarly shaped: the annular first segment or prothorax is lodged in a depression of the posterior aspect of the head; the mesothorax and metathorax are so placed that their upper surface looks backwards, the lower forwards; and this, with the peculiar arrangement of the muscles, gives that remarkable mobility of wing which enables the insect to fly backwards, forwards, sideways, and up and down, with the utmost facility and without turning. The wings are long and membranous, of equal size in the *Agrionidæ*, but the posterior is broader in *Libellula* and *Æschna*. In *Libellula* the posterior angle of the second pair of wings is rounded in both sexes; in *Cordulia* and *Epitheca* it is angulated in the male. The abdomen contains eleven segments, the tenth bearing accessory grasping organs. The posterior limbs are longer than the anterior, and the tarsi are three-jointed. The development of the young is accompanied by metamorphosis, but though the form changes the ferocity of young and adult is alike. The eggs, which are laid on the water after a courtship consisting of violent assaults, give rise to sluggish larvæ, which have no external respiratory organs save in the genus *Agrion:* the intestinal canal is surrounded by tracheal tubes, and the water, which is admitted through the valvular anal aperture, may be discharged with sufficient violence to impel the animal rapidly forward. But the chief interest lies in the oral armature. The basal piece (*mentum*) of under lip is, in rest, laid back against the breast, and is hinged to the large triangular plates which represent the stipites and inner plates of the ligula. The outer plates and the palpi are fused into lateral plates, denticulate on their inner margin, and working shear fashion against each other. In rest this complex mechanism conceals the face, and is hence called the *mask;* but when insects, deceived by the appearance of safety, pass too near the animal, whose movements are too sluggish to allow it to pursue its prey, the jointed mask is straightened, and the passing insect unexpectedly seized. The larval stage lasts for a year; the perfect insect, when it escapes from the nymph case, has the wings soft and folded, and remains quiet for some time till they are ready for flight—

> 'He dried his wings, like gauze they grew;
> . . . . . .
> O'er moor and marsh and holt he flew,
> A liquid flash of living blue.'

The family is of very wide distribution: the *Callepteryx* extends to South America: the small blue *Agrion* and *Æschna*, which reaches to 2½ inches in length, are common European forms. But the familiar *Libellula* is the most extensively distributed, and the numerous species are grouped according to the number of rows of cells at the base of the first pair of wings.

DRAGONNADES, the name given to the persecutions directed against the Protestants chiefly in the south of France, during the reign of Louis XIV. They commenced in Poitou, and their nature may be understood from a letter from Louvois, the French minister, to Marillac, the governor of the province. It is dated 18th March, 1681, and says, *inter alia*, that his majesty wishes that the greatest number of troopers and officers be billetted on the Protestants, and that when a just division makes them liable only to ten they may be saddled with twenty. Marillac, thus instructed, lost no time in giving full effect to the letter, and the Protestants were everywhere subjected to cruel extortion and gross indignity at the hands of a brutal soldiery. These dragonnades were practised with still greater atrocity in Béarn, in 1684, and in all the other provinces where the Protestants existed in any considerable numbers. Resistance was attempted in several instances; thousands of the most enlightened merchants and skilful workmen left the country, carrying their talents and industry into the service of its enemies; but the far greater number, seeing resistance hopeless, and overcome by terror, gave in a feigned adhesion to Popery. The clergy, with Bossuet at their head, were not ashamed to make a boast of such conversions, and ultimately succeeded in stimulating the bigoted monarch to crown his folly and iniquity by the revocation of the edict of Nantes.

DRAGON'S BLOOD, a resinous juice obtained by incision from several different plants found between the tropics;—from the trunk of the *Pterocarpus draco*, a tree of the natural order Leguminosæ, growing in the West Indies, which yields American dragon's blood; from the *Calamus draco*, a palm of

the East Indies, from which it is obtained, according to Kampfer, by boiling the fruit; from a *Dalberjia* in Guiana, and a *Croton* in South America; from the *Dracæna draco*, the native country of which is not known with certainty, but is supposed to be Africa. A single tree of this last species, which was introduced into the Canaries at the time of the conquest, acquired enormous dimensions, and has been visited and celebrated by every traveller, but was destroyed by a storm in 1867.

Dragon's blood is obtained, in commerce, in three principal forms—in that of oval masses of the size of a pigeon's egg, enveloped with leaves of the pandanus; in cylinders covered with palm leaves; and in irregular masses, marked with impressions of leaves: that in oval masses is the most esteemed. It is often very much adulterated, and other substances are substituted; particularly gum Arabic and gum Senegal, coloured with logwood, &c. Several of these substances may be detected by their dissolving in water, while dragon's blood is nearly insoluble; others require to be submitted to some chemical tests. Madagascar furnishes this resin of a good quality, but so much mixed with foreign substances that it is little used.

Dragon's blood is opaque, of a deep reddish-brown colour, brittle, and has a smooth and shining conchoidal fracture; when in thin laminæ it is sometimes transparent; when burned it gives out an odour somewhat analogous to benzoin; its taste is a little astringent; it is soluble in alcohol, and the solution will permanently stain heated marble, for which purpose it is often used, as well as for staining leather and wood. It is also soluble in oil, and enters into the composition of a very brilliant varnish, which is much esteemed by artists. Its quality may be proved by making marks on paper: the best leaves a fine red trace, and commands a pretty high price. It was formerly in high repute as a medicine, but at the present time is very little used. An astringent resin, obtained from the *Eucalyptus resinifera* of New Holland, bears the name of *dragon's blood* in the settlements in that country.

Dragon's blood is a mixture of several chemical substances, the proportions of which vary in different specimens of the resin. When treated with nitric acid it is attacked, and yields a compound called nitrodracylic acid, isomeric with nitrobenzoic acid. There is a series of dracylic compounds, but no dracylic acid. Heated with potash dragon's blood yields protocatechuic acid, paroxybenzoic acid, phloroglucin, and other decomposition products.

DRAGOON, a kind of mounted soldier, of French origin, trained originally to fight either in or out of the line, in a body or singly, chiefly on horseback, but, if necessary, on foot also. The dragoons were mounted, armed, and exercised as these objects require. They probably took the name of dragoons from the Roman *draconarii*, whose lances were adorned with figures of dragons, or from the musket (*dragon;* English, *drake*) which they carried. Experience proving that they did not answer the end designed, they were hardly ever used in infantry service, and now form a useful kind of cavalry, mounted on horses too heavy for the hussars, and too light for the cuirassiers. The first dragoon regiment raised in this country was the Scots Grays (1681). There are at present in the British army eighteen regiments of dragoons and seven of dragoon guards, the latter being mounted and accoutred more after the fashion of heavy cavalry than the former.

DRAGUIGNAN, a town, France, capital of department Var, in a beautiful valley, whose slopes are covered by the vine and olive, 41 miles north-east of Toulon; pop. 9819. It was founded in the fifth century, and early became one of the chief towns of Provence. In the civil and religious wars of France the possession of it was frequently contested. It is not well built, but has several interesting edifices, among others a fine clock-tower, a museum, a botanic garden, and several fine fountains. The manufactures consist of silk thread, soap, leather, brandy, and oil. The trade in these and in wine is considerable.

DRAINING, in agriculture, a method of improving the soil by withdrawing the water from it. Though practised by the Romans, it was not till after the middle of the last century that the importance of draining began to be fully understood in Britain. The public attention is said to have been first excited by the practice of Elkington, a farmer and self-taught professor of the art of draining in Warwickshire and the adjoining counties. On the practice of this artist most of the future improvements are founded; and they have been ably embodied in the account of his practice by Johnston (Edinburgh, 1797, 4to; subsequent editions in 8vo).

The successful practice of draining in a great measure depends on a proper knowledge of the various strata of which the earth is composed, as well as of their relative degrees of porosity, or capability of admitting or rejecting the passage of water through them, and likewise of the modes in which water is formed, and conducted from the high or hilly situations to the low or level grounds. In whatever way the hills or elevations that present themselves on the surface of the globe were originally formed, it has been clearly shown, by sinking large pits, and digging into them, that they are mostly composed of materials lying in a stratified order, and in oblique or slanting directions downwards. Some of these strata, from their nature and properties, are capable of admitting water to percolate or pass through them, while others do not allow it any passage, but force it to run or filtrate along their surfaces, without penetrating them in any degree, and in that way conduct it to the more level grounds below. There it becomes obstructed or dammed up by meeting with impervious materials of some kind or other, by which it is readily forced up into the superincumbent layers, where they happen to be open and porous, soon rendering them too wet for the purposes of agriculture; but where they are of a more tenacious and impenetrable quality, they only become gradually softened by the stagnant water below them; by which the surface of the ground is, however, rendered equally moist and swampy, though somewhat more slowly than in the former case. It may also be observed, that some of the strata which constitute such hilly or mountainous tracts are found to be continued with much greater regularity than others; those which are placed nearest to the surface, at the inferior parts of such hills or elevations, being mostly broken or interrupted before they reach the tops or higher parts of them; while those which lie deeper, or below them at the bottom, show themselves in these elevated situations. Thus, that stratum which may lie the third or fourth, or still deeper, at the commencement of the valley, may form the uppermost layer on the summits of hills or mountainous elevations.

Where grounds are in a great measure flat, and without such degrees of elevation as may be sufficient to permit those over-proportions of moisture that may have come upon them from the higher and more elevated grounds to pass readily away and be carried off, and where the soils of the land are composed or constituted of such materials as are liable to admit and retain the excesses of moisture, they are exposed to much injury and inconvenience from the

retention and stagnation of water. Such lands consequently require artificial means to drain and render them capable of affording good crops, whether of grain or grass.

To perform properly the business of draining, attention should not only be paid to the discrimination of the differences in regard to the situation of the lands, or what is commonly denominated drainage level; but also to the nature, distribution, and depth of the materials that constitute the soils, or more superficial parts of them; as upon each of these some variety, in respect to the effects arising from water retained in them, may depend. The general origin of that wetness of land which it is the object of under-draining to remove, will be found to be the existence of water in substrata of sand, gravel, open rock, or other porous substances, which either lead to the surface, or, having no natural outlet, become filled or saturated, while the pressure of more water coming from a higher source forces that which is in the lower part of the stratum upwards through the superior strata to the surface; thus occasioning either bursts and springs, or a general oozing through the soil. The object in under-draining, therefore, is not to catch the surface water, but that which flows through their inferior strata; and, for this purpose, it is necessary to make a sufficient channel, either at the lower parts of the porous stratum, or in such part of it as may most conveniently carry off the water, so that the pressure referred to may be relieved, or the water intercepted before it reaches the surface. It must always be kept in mind, then, that under-draining and surface-draining are operations essentially distinct; and every care must be used in practice not to blend them in the execution. If surface water be allowed to get into covered drains the sand and mud which it will carry into these subterraneous channels will soon choke them up, and occasion bursts, creating, as may be conceived, new swamps; while the expense of taking up and relaying the under drains will be very great, and the execution imperfect, the sides being found never to stand a second time so well as when first formed.

Wetness of land, so far as it respects agriculture and is an object of draining, may generally depend on the two following causes:—first, on the water which is formed and collected on or in the hills or higher grounds, filtrating and sliding down among some of the different beds of porous materials that lie immediately upon the impervious strata, forming springs below, and flowing over the surface, or stagnating underneath it; and, secondly, on rain or other water becoming stagnant on the surface, from the retentive nature of the soil or surface materials, and the particular nature of the situation of the ground. The particular wetness which shows itself in different situations, in the forms of bogs, swamps, and morasses, for the most part proceeds from the first of these causes; but that superficial wetness which takes place in the stiff, tenacious, clayey soils, with little inclination of surface, generally originates from the latter.

Drains.—The drains used in land-drainage may be divided into two classes—*open* and *covered* drains. These again may each be subdivided into drains intended merely to act as water-courses, and drains which, in addition to acting as water-courses, are also intended to carry off the surplus water from the land through which they pass.

Open Drains.—The rudest forms of open drains are the deep furrows, lying between narrow high-backed ridges, which are still to be found in some parts of the country, with their accompanying water-furrows ('gaw' furrows or 'grips') for discharging their streams. These are only meant to carry off the surplus water after the soil is completely saturated. In doing so, however, they carry along with it all the best portions of the soil, and of the manure which may have been spread upon its surface.

Open Drains as Water-courses.—The ordinary ditch (dike) is the common form of this kind of drain, which, though necessary to a certain extent, ought, nevertheless, to be sparingly seen where a perfect system of drainage has been effected. They are constant sources of annoyance and expense from their sides crumbling in, the numerous weeds which they harbour, and the thorough scouring which they require every year. Open ditches occupy an important place in the early stages of draining bogs; but after the bog has become consolidated the greater portion of them may be dispensed with, and their places supplied by large covered drains.

Open Drains for collecting Water from the Land through which they Pass (Sheep-drains).—These are employed in drying the surface of mountain pastures, where a more expensive and perfect system of drainage would not yield an adequate return for the outlay. They consist of trenches of 12 or 16 inches in depth and 18 in width, placed so as to intercept all the water which may flow from portions of land above them. They are opened at intervals in a direction nearly transverse to the line of the greatest slope, and should have just sufficient inclination to keep the water flowing towards the mains or leaders. These latter should be cut in the hollows, or in such other places as will permit the small drains or feeders to empty themselves most readily into them, and be made to discharge into the nearest water-courses.

Covered Drains.—We now come to the consideration of the more important description of drainage—the removal of water by means of covered drains. The simplest of all the forms of these are what are called *mole-drains*, and they are formed by means of a machine called the mole-plough. This machine consists of a strong wooden beam and stilts, somewhat in the form of the subsoil plough; but instead of the apparatus for breaking up the subsoil in the latter, a short cylindrical and pointed bar of iron is attached horizontally to the lower end of a broad coulter, which can be raised or lowered by means of a slot in the beam. The beam itself is sheathed with iron on the under side, and moves close to the ground, thus keeping the bar at the end of the coulter at one uniform depth. This machine is dragged through the soft clay, which is the only kind of land on which it can be used with propriety, by means of a chain and capstan, worked by horses, and produces a hollow channel very similar to a mole-run, from which it derives its name. Pl. XLIII. fig. 1 represents the machine at work.

Plug-draining, like mole-draining, does not require the use of any foreign material, the channel for the water being wholly formed of the clay. In this species of drainage, after the two first spits have been removed, the drain is completed by means of a peculiar tool called the bitting-iron (fig. 15), by which a neatly formed trench, narrow at bottom, is constructed, from which any crumbs are removed by a narrow scoop. A number of cylindrical pieces of wood, fastened together by iron hoops so as to form a flexible bar, to the end of which a chain is attached, is then placed at the bottom of the trench, and the clay previously dug out is now shovelled in and firmly rammed down. The wooden block is then drawn forward by means of a pole thrust through one of the links of the chain till it is again exposed, with the exception of a small part at one end. The further portion of the trench above the blocks or plugs is now filled in and rammed, and so on till the rest of the drain is finished.

Wedge-drain.—This, like the mole and plug drain,

is merely a channel formed in the subsoil, and, like it, can only be used in pasture lands. In forming wedge-drains, the first spit, with the turf attached, is laid on one side, and the earth removed from the remainder of the trench is laid on the other. The last spade used is very narrow, and tapers rapidly, so as to form a narrow wedge-shaped cavity for the bottom of the trench. The turf first removed is then cut into a wedge, so much larger than the size of the lower part of the drain that, when rammed into it with the grassy side undermost, it leaves a vacant space in the bottom of 6 or 8 inches in depth, as in fig. 2.

We now proceed to consider the more durable forms of drains.

1. *Stone Drains.*—These are either formed on the plan of open culverts of various forms, or of small stones in sufficient quantity to permit a free and speedy filtration of the water through them. As a specimen of the former of these, we may instance the *box-drain,* which is formed of flat stones neatly arranged in the bottom of the trench. The largest and flattest stones are used in laying the bottom and for covers; the smaller ones are placed on the sides, the whole forming an open tube, as shown in fig. 3. A section of the second description of stone drain, generally known by the name of the broken stone or rubble drain, is given in fig. 4.

Tile-drains.—Of all the materials which have yet been brought forward for forming the conduits of drains, none are so well fitted for the purpose as tiles, or pipes of burned clay. Draining tiles, especially those in the form of pipes, possess all the qualities which are required in the formation of drains, affording a free ingress to water, while they effectually exclude vermin, earth, and other injurious substances. When first introduced they were of clumsy construction, as shown in fig. 18, and being hand-made, sold at a high price. They are now made by machinery, and their expense is very materially lessened.

Draining tiles and pipes have been made in a great variety of forms, the earliest of which, since the introduction of thorough draining, was the horse-shoe tile, so called from its shape. The tiles should always rest on soles, or flats of burned clay, as shown in fig. 10; and each tile should be placed resting on two adjoining soles, to prevent, as far as possible, the chance of any sinking taking place. Fig. 5 represents a section of the finished drain. Pipe tiles, combining sole and cover in one piece, have been made of various shapes, but the best form appears to be the cylinder. A section of a drain laid with this description of tile is given in fig. 6. Where a sudden descent occurs in the course of a drain, or where there is a running sand or boggy place, pipes of one size should either be entirely sheathed in larger ones, or they should be furnished with collars. These collars are merely short sections of pipes of such a size as to fit upon smaller ones, as represented in fig. 7, by which means the smaller ones may be so joined as to prevent them from slipping down past each other.

Draining of Springs.—The drawing off of the pent-up waters which are the sources of springs, is a department of draining which requires, for its successful practice, a considerable knowledge of the different varieties of strata. When the theory of springs is understood, and a knowledge of the strata obtained, the judicious application of a few simple drains, made to communicate with the watery layers, will often dry swamps of great extent, where large sums of money, expended in forming furrow drains in the swamp itself, would leave it but little improved. The sources of springs being certain porous layers, or fissures, at greater or less distances from the surface, the point to be sought for is to furnish outlets sufficiently numerous to discharge all the water from the porous bed at its lowest point. A distinction is made between *true* and *false* springs. The true springs are those which are, for the most part, continual, whereas, in dry seasons, the false springs sometimes intermit for considerable periods of time. The true spring is the natural outlet of the inclosed water which gives rise to it, whereas the false springs are occasioned either by the backing-up of a large quantity of water, from the insufficiency of the outlet, till it flows forth at some higher level, in which case they appear above the true springs; or they owe their existence to water which, after having issued from the true springs, has soaked into the soil and again makes its appearance on some obstruction forcing it to the surface. In the latter case the false are below the true springs.

Having ascertained the line of the true springs, the next step is to cut a drain sufficiently deep to reach the watery stratum, at a short distance below the line of the springs. If, upon experiment, it turns out that the superincumbent impervious layer is considerably more than 5 or 6 feet in thickness, it will be proper, instead of incurring the great expense of forming an enormously deep drain, to cut a drain of 4 feet in depth only, and then to sink small wells down to the watery bed, at intervals along its course, and a little to one side, as represented in fig. 11. These wells are to be filled with small stones, so as to afford a ready passage to the water to rise up through the drain. The conduit may be formed of draining tiles or pipes, or of bricks or stones, as may be most convenient, taking care, however, that the culvert is securely formed, and that the floor of the drain is protected by tile soles, or slates, or some other material, to prevent the hollowing action of the great flow of water which may be expected to proceed along it. The small stones should be continued to the height of 8 or 12 inches above the culvert, so as to afford a free passage for the water into the chinks and joinings of the culvert.

In the laying out of drains, the first point to be determined is the place of outfall, which should always afford a free and clear outlet to the drains, and must necessarily be at the lowest point of the land to be drained. This should be ascertained by a levelling instrument; and where a large extent of work is to be done, a competent surveyor should always be employed. The next point to be determined is the position of the minor drains; in the laying out of which the surface of each field must be regarded as being made up of one or more planes, as the case may be, for each of which the drains should be laid out separately. Level lines are to be set out a little below the upper edge of each of these planes, and the drains must then be made to cross these lines at right angles. By this means the drains will run in the line of the greatest slope, no matter how distorted the surface of the field may be.

All the minor drains should be made to discharge into mains or submains, and not directly into an open ditch or water-course. As a general rule there should be a main to receive the waters of the minor drains from every 5 acres. Main drains may be conveniently formed of one or more large pipe tiles, or of one or a combination of horse-shoe tiles. A very excellent main drain is formed by combining two horse-shoe tiles with a tile-sole or slate between, to prevent slipping, as in fig. 8. Another, formed by a combination of three horse-shoe tiles, is shown in fig. 9.

The tools used in the formation of drains are few in number, and of a very simple description. They consist of a set of spades—generally three of different sizes—gradually diminishing in width to suit the different parts of drains. For taking out the last narrow spit, to form the seat for the draining pipe,

long, narrow spades, called bottoming tools, as represented in fig. 12, are used. There are also scoops of various widths, furnished with long handles, and rounded or flattened in the soles according as they are required to finish the bottom of the drain for the reception of stones, a horse-shoe tile and sole, or a draining pipe. One of these is shown in fig. 14. For the purpose of laying pipes in minor and deep drains an instrument called a pipe-layer (fig. 13), which enables the workman to lay the pipes without going into the drain or reaching the bottom with his hand, is employed. Where the subsoil is strong or indurated a hand-pick or a foot-pick (fig. 16) is required to loosen it before it can be shovelled out. The other tools of a peculiar description that we shall allude to as employed in drainage are the bitting-iron (fig. 15), already referred to as used in the formation of plug-drains, and Mr. Calderwood's tool for forming conduits in bogs out of the peat, represented in fig. 17.

We shall now briefly consider the beneficial effects of drainage. Every one at all acquainted with the conduct of agricultural operations must be aware of the great difficulties which a wet state of the soil throws in the way of performing these operations with propriety, despatch, or economy of labour. The great object of all the operations of tillage is, along with the removal of weeds, to reduce the soil to a finely-divided state, through every part of which the fine filamentary roots of plants may spread themselves, in order to obtain supplies not only of moisture and air, but of those substances of which they are partly composed, and the due preparation of which is one of the most important functions of all mechanical operations on the soil. The tempering of mortar or clay affords a very apt simile for any operations undertaken on land in a wet state, and furnishes a very true analogy as to the results. It will therefore be evident, that so far from furthering the object in view, ploughing, or other working of land when wet, will have the directly contrary effect of rendering it more stiff and close; and instead of producing a finely-divided and porous state of the soil, so indispensable to the healthy and vigorous growth of crops, will leave it when dry a hardened mass, in which useful plants will find it difficult to obtain even the most scanty subsistence. When water likewise stagnates in a soil air is at the same time excluded, and the necessary amelioration of the organic and inorganic ingredients cannot be effected. In all cultivated soils decaying matter has a positively injurious action, even on its mineral ingredients, by reducing the higher state of oxidation of the iron, generally present, into the lower and injurious condition. In soils permeable to air this evil is at once counteracted by a fresh absorption of oxygen from the atmosphere; but in soils in which water stagnates this remedial process does not exist. The heat of the sun falling upon wet land does not exercise its genial influence in promoting the growth of plants, but expends it in the evaporation of the stagnant water. Water, in being converted to steam, absorbs or renders latent an enormous amount of heat, which is of course robbed from the soil, for it otherwise would be used in the more profitable manner of maturing the crops growing upon it. On the soil, however, being drained to a sufficient depth, its condition in regard to temperature is entirely altered. The redundant water no longer stagnates on it until evaporation takes place, but is immediately carried off. The sun's rays now produce their full effect on the soil and on the crops without being robbed of their heat by the stagnant water of the soil, unable to effect its escape except by evaporation. The chemical effects of drainage in promoting increased fertility are not less striking. Rain-water always contains in solution air, carbonic acid, and ammonia, the two former of which are among the most powerful disintegrators of a soil, causing it to yield up its concealed stores of nutriment. To render these available, however, for the use of plants, they must be made soluble, and this is only effected by the free and renewed access of rain and air through the agency of draining. By enabling the air and carbonic acid to reach the lower parts of the soil a new magazine of nutriment is thus opened up for the plants. These have now a wider range in which they may seek their food, and are thus enabled to extend their roots in search of nutritive matter, which they formerly refused to do in a cold, wet soil, the constituents of which were unfit for the plants' healthy growth.

There are few cases in which the value of drainage is more strikingly illustrated than in the case of wet grass lands. The first effect of a judicious and thorough system of drainage on such lands is the speedy disappearance of rushes and the coarse subaquatic grasses, and the substitution of a rich sward of sweeter and more nutritious herbage, which not only maintains a larger number of animals, but maintains them in superior health and condition. There are no more effectual means for the extirpation of that most destructive disease—the rot in sheep—than removing the superfluous water from the soil. So efficient, indeed, has this been found, that on farms where rot annually destroyed large numbers of sheep not a single instance of the disease has occurred since the land has been drained.

DRAKE, Sir Francis, a distinguished English navigator, was born at Tavistock, in Devonshire, in 1539, according to some authorities, or 1545, according to others, and served as a sailor in a coasting vessel which sometimes made voyages to France and Ireland. He gained the favour of his master, who, on his death, left his vessel to him. Sir John Hawkins, one of his relations, then took him under his care, and at the age of eighteen he served as purser of a ship which traded to Biscay. At twenty he made a voyage to the coast of Guinea; at twenty-two received the command of a ship, and distinguished himself by his valour in the unfortunate expedition of Sir John Hawkins against the Spaniards in the harbour of Vera Cruz. In this affair, however, he lost all which he possessed. Hereupon he conceived an inveterate hatred against the Spaniards, and projected new expeditions against them. He had no sooner made his plans known in England than a multitude of adventurers joined him. He obtained a commission from Elizabeth, and made two cruises to the West Indies, but avoided an engagement with the Spaniards. The result of these voyages, however, was so successful that he received the command of two vessels in 1572 for the purpose of attacking the commercial ports of Spanish America. One of them was commanded by his brother. He captured the cities of Nombre de Dios and Vera Cruz, lying on the eastern coast of the Isthmus of Darien, and took a rich booty. After his return he equipped three frigates at his own expense, with which he served as a volunteer in an expedition to Ireland under the command of the Earl of Essex, father of Queen Elizabeth's favourite.

On the death of his protector he returned to England. Sir Christopher Hatton, vice-chamberlain and privy-councillor of Queen Elizabeth, introduced him to this princess. Drake disclosed to her his plan, which was to pass through the Straits of Magellan to the South Seas, and there to attack the Spaniards. The queen furnished him with means for equipping a fleet of five ships for this purpose. Drake sailed from Plymouth Nov. 13, 1577, and arrived at the Straits of Magellan Aug. 20, 1578. Nov. 6 he succeeded in leaving the straits, but was overtaken by a storm the day after,

which compelled him to steer to the south. Returning to the extremity of the straits he called the bay in which he anchored The Parting of Friends, on account of the separation of one of his ships. New storms again drove him to the south. He now found himself among the islands in the south-western part of the Archipelago of Tierra del Fuego. November 20 Drake came in sight of the island of Mucho, south of Chile, where he had appointed a rendezvous for his fleet. As none of his vessels arrived he continued his course to the north, along the coast of Chile and Peru, in search of Spanish ships and suitable places for making incursions into the country. When his crew was sufficiently enriched with booty he followed the coast of North America to 48° N. lat., hoping to find a passage into the Atlantic. Deceived in his expectations, and compelled by the cold to return to 38°, he named the place where he repaired his vessels New Albion, and took possession of it in the name of Queen Elizabeth. September 29, 1579, he directed his course to the Moluccas, and anchored at Ternate November 4. He narrowly escaped being lost near Celebes. November 3, 1580, he arrived at Plymouth; April 4, 1581, Elizabeth herself went on board Drake's vessel, then at anchor at Deptford, knighted him, and approved of what he had done.

In 1585 Drake disturbed the Spaniards anew in the Cape Verd Islands and in the West Indies. In 1587 he commanded a fleet of thirty sail, which burned a part of the celebrated armada in the harbour of Cadiz, and in 1588 commanded, as vice-admiral, under Lord Howard, high-admiral of England, in the conflict with the Spanish armada. A rich galleon surrendered to him at the mere sound of his name, and he distinguished himself in the pursuit of the enemy. In 1589 he commanded the fleet intended to restore Don Antonio to the throne of Portugal. But this enterprise failed on account of a misunderstanding between Drake and the general of the land forces. On his return he was elected as member of Parliament for Plymouth, and his name appears in the session of 1692–93 on all the committees of public business.

The war with Spain still continued. Drake and Hawkins proposed to Elizabeth a new expedition against the Spaniards in the West Indies, which should surpass all that had preceded it. They were willing to bear a part of the expense, and the queen furnished ships. The expedition, however, was unfortunate. Nov. 12, 1595, the day of Sir John Hawkins' death, Drake's vessel, in sailing from the port of Porto Rico, was struck by a cannon-ball, which carried away the chair in which he sat without doing him any injury. The next day the Spanish vessels were attacked before Porto Rico with great violence, but without success. He then sailed to the Continent, and set fire to Rio de la Hacha and Nombre de Dios; but having undertaken an expedition against Panamá, some days after, which entirely failed, he was attacked by a slow fever, which, combined with disappointment, terminated his life about the close of the year 1595, or as stated by others 1596. Among the honourable uses of his wealth must be mentioned his providing Plymouth with water, which he brought from the distance of 20 miles. To him England is indebted for the introduction of the potato. (See The Famous Voyage of Sir Francis Drake into the South Sea, and hence about the whole Globe of the Earth; London, 1600, 12mo, edited by Francis Pretty, who served under Drake.)

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